The Builder.

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The Discussion of the District Surveyor.

THE discussion which has been carried on at considerable length in reference to a paper read in December at the Surveyors' Institution, on the "London Building Act and the Official Supervision of Buildings," has shown that very few of those who took part in it were converted to the views propounded by Mr. Weaver in the paper reported in our issue of December 17; and we are certainly not among those few. It does not appear to us, in fact, that the real object of the paper was quite accurately set forth in the title given to it. To those who read between the lines it must have been pretty evident that the paper was really an attack on the efficiency of District Surveyors and the logical *raison d'être* of their office, written with a view to the impending Bill for the organisation of municipal districts, and with the object of laying the foundation for a claim for the abolition of the district surveyor, as an official responsible to the central municipal body, and the decentralisation of the duties appertaining to the office, in order to get these duties transferred, for each new municipal district, to an official responsible only to the local body.

We can imagine nothing worse for the building government of London. It is to be hoped, no doubt, that the new municipal councils, if formed, would be somewhat superior bodies to most of the existing vestries; with somewhat more of public spirit and somewhat less addicted to the encompassing of private ends. But they would nevertheless be almost certain to be composed of persons having large interests in house property and other building property in the district they represented. It is almost impossible to suppose that their line of action would not be more or less influenced by this fact—even (at the best) without their being quite aware of it themselves. And in the event of the abolition of the present office of district surveyor responsible to the central authority, which is evidently aimed at in Mr. Weaver's paper, and the imposition of his duties on the surveyor of the local authority, the result would be that the whole supervision of London building would be in the hands of a number of officials with separate and limited responsibility, in the pay of the very persons whose property they would in many cases be supervising, and liable to dismissal at the instance of those persons. Such an arrangement would be laying the foundation, at all events offering the temptation, for a great deal of uneven dealing with building property; it would give the opportunity, at all events, of putting private before public interests; and it is hardly to be supposed that such opportunities would never be made use of. Under the present system the district surveyor is a perfectly independent official, who can carry out his duties with reference to buildings in his district without any regard to the personal interests of the building-owner or to the effect of any possible animus of the latter against him for the execution of his duty; for even if the building-owner happened to be a member of the London County Council, one person in such a body would have no such influence as would enable him to get the surveyor under his thumb, or to make any kind of retaliation against him for an inconvenient exercise of his powers.

That it is most important that this practical independence of the district surveyor should be maintained must be obvious enough to any rational and unprejudiced person. But it is also important on structural and architectural grounds that the supervision of London buildings should be in the hands of the officials of a central authority. In whatever way London may, for the convenience of some kinds of administration, be divided up under local authorities, it is in an architectural sense one city; and it would be most undesirable that such points as the alignment of street frontages, the thickness of walls for various purposes, and many other matters of the same kind, should be liable to be dealt with on a different basis in each district. In these respects what is good for one district is good for the whole of London.

We cannot feel the least surprised at a certain amount of strong feeling displayed by some of the district surveyors who took part in the discussion of the paper referred to; on the contrary, we feel inclined to share it. The paper was essentially an attack on the London district surveyors, and a foolish and invidious one, even down to the final shot in Mr. Weaver's reply, in which he intimated that he could not expect much support from a body from whom he was proposing to take away their income. There is a good deal more in it than that. The innuendos made against the district surveyors were uncalled for and perfectly absurd. No body of men could be found who, as a whole, have done their work better and more conscientiously than the district surveyors of London. Nor do we in the least agree with the theory that they ought to be debarred from private practice. On the contrary, we consider that when the London County Council adopted that regulation, which in the course of circumstance has only very partially come into force yet, they made a decided mistake. We do not say that those who have been appointed since that regulation came into force have not fully performed their duty. But it stands to reason that the ultimate result of that rule, if it is maintained, must be that a class of men will be candidates who are not equal to the general level of those who came forward for the office when it was simply an appendage to ordinary architectural practice; and this must in the long run be a disadvantage. It is important that the district surveyor should be an all-round architect, not a mere official surveyor. Such a man is likely to have wider experience and knowledge, and to be more independent of any kind of interference with his duties, than one who is an official surveyor and nothing more; and our advice would be that the County Council should give up that requirement and return to the old system of appointment, under which they could have, and had, the service of eminent architects. Nor can we see the slightest reason to interfere with the system of payment of the surveyors by fees from the defaulting parties. It is a perfectly logical system, and it is far more fitting that the payment should come out of the pockets of those who have made the defaults which have rendered the intervention of the surveyor necessary, than that it should come out of the pockets of ratepayers who are entirely innocent of and unconnected with the breaches of rule which the surveyor is appointed to prevent.

The one point made by Mr. Weaver was as to the inconvenience of the dual control whereby matters of structure are under the jurisdiction of the district surveyor and those of sanitation (or a portion of them) under that of the vestry surveyor. This has resulted, he affirms—and no doubt it may result—in the approval of a plan by the district surveyor in which it was afterwards found that the position of the water-closets was disapproved by the vestry surveyor, as the official authority on this point. That is an inconvenience from which a builder or building-owner may suffer if he is not aware of the dual control, though it may be said that it is his business to be aware of it; and it is an inconvenience in any case to have to submit plans to two officials instead of one. But we should suggest a solution of the difficulty exactly contrary to that suggested by Mr. Weaver. The true course would be to put the drains and sanitary arrangements, everything in short connected with the construction of the building, into the hands of the district surveyor also. The reply of course will be that different parishes are under different circumstances as to drainage and water supply. As to the latter they cannot at present help themselves; but as to the former, it is a question whether drainage and sanitary regulations ought not to be under the same conditions all over London, and whether it is well for parish vestries, or their proposed successors, to have a special control of their own in these matters. But even if things are left *in statu quo* in this respect, the inconveniences of the dual control are a minor matter compared with the disadvantages which would be certain to result from taking the general jurisdiction over building in London out of the hands of the independent officials of a central body, and putting it into the hands of more or less dependent local officials. If such a step as that is taken, the public will unquestionably have cause to regret it.

THE REFORM OF LOCAL TAXATION.

IN 1896 a Royal Commission was appointed "to inquire into the present system under which taxation is raised for local purposes, and report whether all kinds of real and personal property contribute equitably to such taxation and, if not, what alterations in the law are desirable in order to secure that result." This Commission has now just issued two interim reports of great interest and value. One is concerned with the rating of tithes (with which we do not now deal), the other is on the question of the valuation of property for rating purposes. Every day this question is becoming more important; the tendency of things is to throw greater burdens on ratepayers, hence the basis on which payments have to be made is an essential to a fair system of taxation.

Broadly speaking, this report has two divisions. The first contains a sketch of the history of the subject from an early period, and summarises the various suggestions which have been made for alterations in the system of valuation. The second part contains recommendations for the future, which are now made so that legislation may follow as speedily as may be.

At the present time nothing is more striking than the extraordinary confusion and want of system in regard to valuations—a want of system characteristic of English polity, but none the less injurious and unfair in its results. Two valuations of the same property may be made for the purpose of raising Imperial taxes, namely, one for the Income Tax and one for the Land Tax; and in addition three valuations may be made for the purpose of raising local rates, namely, one for the Poor Rate, one for the County Rate, and one for the Borough Rate.

In London, affairs are in a more business-like state, for the quinquennial valuation under the Valuation (Metropolis) Act, 1869, is the basis not only for Imperial taxes, but for the several local taxes—the county rate, the police rate, the church, highway, and every other rate.

The want of symmetry in London is therefore shown not in regard to the basis of valuation, but in connexion with the bodies by whom it is made; though here, again, things are in a far better state than in extra-Metropolitan districts. "In the County of London there are sixteen unions in which the Guardians appoint the Assessment Committees under the Union Assessment Committee Act, 1862, and fourteen separate parishes in which either the Guardians or the Vestry elect the Committee." There is, therefore, from a practical point of view nothing very serious to be urged against the state of affairs in London, and we are inclined to agree with Mr. Cripps that there is no present need for any alterations, since, to quote from his reservation, "uniformity in the assessment of rateable property in the Metropolis has been substantially secured."

When we come to the recommendations of the Commission we find an attempt made to secure greater uniformity. An obvious beginning—the only reasonable basis—is "that there should be one Valuation Authority in each county, and the Valuation List of that Authority should be the basis on which rates and taxes for all purposes should be raised." This, of course, is on paper a simple remedy for the present state of things. It is obvious, however, that local knowledge cannot be dispensed with, and therefore there follows a secondary recommendation that the Valuation Authority, which in a county shall consist of members appointed by the County Council and by the Councils of Boroughs, and in a borough of members appointed by the Council, shall have power to divide the area into convenient districts. "In each district a committee shall be appointed composed of members of the Valuation Authority and of representatives of Boards of Guardians, Borough Councils, and Urban District Councils." No doubt the subject is one difficult of solution, but the duplication of valuation authorities seems to be undesirable. What may be termed the District Authority will—it seems to us—be the real authority, and the Valuation Authority little more than a local court of appeal. For it is proposed that the Valuation Authority shall hear any objections to the assessment of ratepayers by the Local Authority and that, if necessary, there shall be a further appeal to Quarter Sessions. No doubt local knowledge is usually considered necessary for the preparation of the valuation lists, but this knowledge will, if the recommendations of the Commission are carried out, be less necessary in the future. For one important suggestion is "that the valuation list should be prepared, whenever practicable, by professional surveyors." This recommendation, if carried out generally, would have at any rate the result of adding largely to the general income of a very able body of professional men. On the other hand, in country districts a professional valuer is often less capable of gauging the real value of a house than the local member of the Assessment Committee. Where there are buildings used for commercial purposes, railways, or large mansions, no doubt the professional valuer is far more capable than any one else of arriving at a sound value.

But if there are to be professional valuers for each valuation, one thing is certainly essential. They should be paid by a salary and not by a commission on the valuation. The tendency of the professional valuer is to rate property highly; he is inclined, as it were, to favour his clients the rating authority. Hence also we may fairly expect that professional valuations will have a tendency to increase ligitation. There is nothing more calculated to raise the fighting instinct in the British householder than the idea that he is overrated. On the whole it appears that this recommendation is undesirable, and that each Valuation Authority should be left to decide for itself if a professional valuer's services are required, and over what area.

There are two other recommendations of considerable importance to which attention must also be given. One is "that legislation should provide for a maximum scale of deductions," the other "that legislation should provide for compulsory returns from owners and occupiers of rent paid and other particulars." That the latter recommendation should be incorporated in an Act of Parliament we cannot doubt, for at present valuations are often made much in the dark. The fullest particulars are desirable if a sound judgment as to the value of a property is to be formed. There is no doubt that at present many valuations of dwelling houses in rural districts are haphazard proceedings, and it is desirable that this should be put an end to as speedily as possible.

Various recommendations deal with the collection of the rates; no doubt this part of the matter is also capable of great improvement. But most persons mind little how the rates are collected; what they care for is the basis on which they are levied.

There cannot, we think, be any difficulty in legislation on the lines of these recommendations, for they appear to be entirely in accord with the views of all the witnesses who have given evidence before the Commission. "They (the witnesses) have agreed, and we entirely concur in their opinion, that these conditions (uniformity, equality, simplicity, and economy) are greatly wanting under the systems which now exist in the different valuation Bills throughout the country outside the Metropolis, though there is some difference of opinion as to the precise mode by which such conditions should be secured. A general opinion has been expressed by most of the witnesses in a number of resolutions, which have been forwarded to us by public bodies, that it is desirable to have one valuation authority and one system of arriving at valuations for the whole rating area over which common taxes are raised; that upon such valuation all rates and taxes, both for local and Imperial purposes, should be charged and levied; and, further, that if possible provision should be made to obtain uniformity in valuation throughout the whole

country." This is the key-note to the recommendations which have been made by the Commission, some of which we have set out verbatim, while of others we have given the substance. Any legislation on these lines will be the end of a long series of changes, dating from a very early period, some of which are of historical interest. Thus, so late as 1795, it was held that stock-in-trade was liable to be assessed, even "without evidence of usage." It is difficult to imagine the feelings of a large contractor at the present day if he had to pay rates on his stock-in-trade. But it was not till 1840 that the Legislature finally decided that stock-in-trade was not rateable.

Again, as the Commission point out, "the difficulties of applying the principle of rental value to certain classes of properties and commercial and industrial undertakings are apparent, and particularly the difficulty of estimating the rental in each parish of properties extending over a number of parishes, such as railway lines and stations, tramways, waterworks and water mains, gas works and gas mains, docks, electric light installations, and telephones." Here, of course, comes in the desirability, nay, in some places, the necessity, of professional assistance in making the valuation; and the still greater desirability of having one uniform valuation for all taxes, so that commercial undertakings shall be valued and rated on a uniform basis. If this is done it will be an immense convenience to business men. Moreover, it is possible that a better system of valuation may prevent, in some districts, the need for heavier rates. A better system of valuation would probably result in a generally higher level of valuation.

NOTES.

Architecture at the Royal Academy.

WE understand that there is to be an initiation of a new principle this year in the admission of drawings for the Architectural Room at the Royal Academy. In the first place, original designs only are to be admitted; drawings of ancient work will be excluded. This of course is what the Architectural Room is primarily intended for; and though picturesque representations of ancient work are often among the best of the exhibits, their proper place would rather be in the Water-colour or Black-and-white Rooms. We presume, however, that studies for the restoration of ancient buildings would be considered in a different light, as they are really architectural studies and not mere representations of fact. There ought to be some understanding about this. Otherwise, we welcome the announcement, especially considering the small size of the Architectural Room; and we hope that one result will be the further encouragement of adequate plans of buildings, as well as elevations and perspectives, as at Paris. Another change that is to be looked for is that exhibits offered by firms employing artists will not be admissible under the name of the firm, but only under the name of the actual designer. This is an admirable and most wholesome innovation if it can be carried out; but "Quis custodiet"? Who is to know always by whom a design was actually made?

Proposed Legislation.

THE characteristic of the present Government is want of courage in its domestic legislation. It is clear from the statement of the Duke of Devonshire in the House of Lords at the beginning of the week, that the subject of secondary education is to be dealt with in a functional fashion, and that the Government have not quite made up their minds about it. The Bill which Mr. Chaplin introduced on Monday upon the water question, in regard to intercommunication between the systems of the different companies, is a fragmentary measure. It shows that the Government have no fixed policy in regard to the water supply of London, and that they are content to go on bit by bit, letting the question drift. It is noticeable, however, that in this Bill Government interference with the water companies appears to be more marked than heretofore. It may be that things are tending towards the handing over of the water supply of London to the State. London is so different in its conditions from the provincial cities—it is such a huge, complex place that it may be that the solution of this question, which would be most in the interest of the Metropolis, would be to make the water supply of London an Imperial matter, just as the police now is.

Workmen's Compensation Again.

EVERY week adds to the novel points brought forward, and to the singular decisions arrived at, in connexion with the new Act. Judgment was given at Newport last week in a case which was decidedly peculiar both as to the circumstances and the award. A ganger employed by a firm of railway contractors was killed by an express train whilst walking to work. It was stated that he had been ordered not to walk on the main line, and had been recommended a safe route. Nevertheless, the judge held that as the accident arose "out of, or in course of," his employment, the representatives of the deceased were entitled to compensation, and awarded them 250*l.* Now, many workmen habitually take "short cuts" to work along or across railway lines—sometimes with the knowledge and consent of the railway company and their employers, often without. They would, however, scarcely be justified in regarding this decision as ensuring them compensation in the event of a similar accident, although it is quite possible that the attempt would be made. The railway companies never grant a person a free "walking pass" without requiring a written indemnity; and without the pass he would, of course, be a trespasser. The case in question would be on a different footing in this respect, the deceased man being employed on the railway company's own works.

The Manchester Ship Canal.

THE twenty-seventh ordinary meeting of the Manchester Ship Canal Company was held on Thursday, the 16th inst., and considerable jubilation was shown on account of the continued progress of the undertaking. The net earnings for the half-year amounted to 61,000*l.*, an increase of nearly 50 per cent. over the earnings for the corresponding period of the previous year. After paying the interest on the debentures, the sum of 16,270*l.* was available for interest on the loan from the Corporation of Manchester; this is only a small portion of what is due to the Corporation, but if the present progress is maintained it will not be long before the Corporation's interest in the Canal is a valuable asset. The timber trade showed a slight falling off in 1898, the total for that year being 213,000 tons, while the total for 1897 was 223,000 tons; in 1896, the amount was 180,000 tons, and in 1895 only 94,000. The chairman stated that a similar decrease in 1898 had taken place at most of the ports of the country, but the directors believed that this year they would get as much timber as in 1897, and possibly more. We hope that this is an accurate forecast, as it speaks well for a continuance of activity among architects and builders.

Royal Insurance Company's Rules.

THE new rules of the Royal Insurance Company for electrical installations are deserving of special notice, as they are remarkably well arranged, and contain several innovations. Rules are generally dreary reading, but these are enlivened by illustrations showing specimen types of enclosed motors, sketches of motor-regulating switches, new systems of lamp wiring, &c., which will prove helpful and suggestive to both electricians and consumers. There are some very stringent clauses respecting the working of dynamos and motors in factories and places where inflammable materials are used, but we are glad to see that no dogmatic assertions are made about the necessity, or otherwise, of earthing the machines. In our opinion, the rule of the Institution of Electrical Engineers, which insists on the necessity of having motors well insulated from earth, is of doubtful advantage from a fire risk point of view; and where high voltages are employed it is objectionable, as the attendant is very apt to get severe shocks from it. The advice to have no single circuit from a distributing centre greater than that required to carry a current of five amperes is good, as it avoids the necessity of branch cut-outs, and keeps them all on the distributing-board. We would suggest that a simpler rule should be given for the sizes of conductors. It is absurd to say that a 19/14 cable must not carry more than 97·3 amperes for lamps and not more than 77·8 for motors. The insulation test is good, being the first one we have come across which demands not only the measurement of the resistance between the mains, but the insulation resistance of each main to earth. Some years ago we pointed out the necessity of doing this, and gave a simple method of making these measurements, which has been adopted by many leading electricians.

The Spelling of "Siphon."

IT is the common though not invariable habit, in architectural books and other publications, to spell this word "syphon." How the mistake arose we know not; probably from some idea that it looked better so. It is wrong, however, and falsifies the origin of the word, which is simply the Greek *σίφων*, signifying a hollow reed or tube. *y* in Latin and English is the correlative of the Greek *u* (*υ*); the letter *i* in Greek remains unaltered in Latin and English, except for the dot over it. *Siphon* is therefore the correct spelling, and ought to take the place of the unauthorised "syphon."

Condition of Swinton and Pendlebury.

DR. THEODORE THOMSON'S Report to the Local Government Board on the persistence of enteric fever in the Swinton and Pendlebury Urban District, and on the sanitary circumstances and administration of the

district, states that the houses in the district are mostly two-storied brick buildings, in the main in fair condition, although there would seem to have been in the past a good deal of "jerry" building in the district, with the result that not a few houses of apparently good exterior are damp, and also admit rain through defective roofs. The condition of house and court-yards leaves much to be desired. Many are paved with cobbles, which allow accumulation of filth between their interstices, and others are unpaved. Many are in a very dirty condition, owing to vegetable and other objectionable refuse cast on the yard surface. The chief method of disposal of excrement and house-refuse is the privy-midden system, the middens being usually capacious structures, capable of containing the excrement and refuse of three or four dwellings contributed during several months; and into these receptacles are also cast ashes, vegetable refuse of all sorts, and not uncommonly animal refuse also. They are usually offensive nuisances. For the most part they are cleansed once every two or three months, although in many instances a longer period than this elapses. The houses drain to sewers which are for the most part of earthenware pipes, jointed in some instances with clay, in other instances with cement. The water supply is good. The general conclusion is that the enteric fever is associated with the filthy conditions too often found in connexion with the surroundings of this class of dwelling in town districts. Unpaved and badly paved yards, allowing refuse, both liquid and solid, to pollute the ground; defective house and yard drains, bringing about a like result; and, above all, large privy middens containing the accumulated excreta of months, much of the more liquid part of which soaks into and fouls the neighbouring soil. "In these various ways the soil on which much of Swinton and Pendlebury stands is liable to serious fouling; and in view of the suitability of soils thus befouled as a medium for the growth and multiplication of the bacillus of enteric fever, it may well be that here is to be found an explanation of the persistence of that fever in the district."

Electric Railways.

MR. HOLROYD SMITH, M.I.E.E., in his paper on "Some Methods of Collecting Energy in Electric Railways," read before the Civil and Mechanical Engineers' Society last week, began by pointing out that in the earliest attempts at electric traction primary batteries were used, and that they were therefore doomed to failure. In his opinion primary and secondary batteries are not, and never could be, economical. He then gave the history of the development of the methods employed for collecting energy from the high-pressure conductor. The car wheels rolling on the conductor were tried at first, but this had to be abandoned owing to the sparking caused by dirt getting between the wheels and the conductor. Then a combination of wheel and brushes was tried, and this developed into two brushes kept pressed on each side of the conductor by means of a spring. Afterwards sliding shoes, which are able to accommodate themselves to the vibrations of the car, were used, as in the City and South London Railway, and then, as in the conduit system, the conductor was placed inside a slotted tube in which two shuttles connected by a flexible bar serve as collector. The lecturer described an ingenious arrangement which he had invented to enable the trolly wheel to press uniformly on the wire at all inclinations of the trolly pole. After the lecture there was an interesting discussion.

New System of Electric Traction.

AT the Institution of Electrical Engineers last week Mr. Miles Walker read a paper on "Electric Traction by Surface Contacts," with special reference to the system invented by himself and Professor Silvanus Thompson. Although many surface contact systems have been elaborated since Professors Ayrton and Perry devised the first one eighteen years ago, yet a drawback to nearly all of them is the danger that a stud may be left alive after the car has passed over it. So far as safety is concerned, this new system leaves little to be desired, and that it is thoroughly practical the smooth working of the experimental line at Willesden abundantly proves. The most serious drawback seems to be the possibility of losing contact with the high-pressure main. For example, if, owing to dirt or to a piece of paper, the skate underneath the car fails to make contact at any stud, then that stud remains dead. The momentum of the car taking it forward, the preceding stud also becomes dead. In order to make contact in the event of such an accident each car must carry a 500-volt battery, and the difficulty of keeping this battery in order is a serious consideration. This difficulty might be got over by a small rotary converter, or by so modifying the switches that they could be worked by a battery of much lower voltage. We understand that Mr. Walker has been working with considerable success in this latter direction. The switches and general design of the system are more complicated than that invented by Mr. Kingsland, which we described last year. Its safety, however, is, perhaps, greater. In the subsequent discussion several speakers spoke of the enormous leakage which took place from the studs under certain very special conditions, but this seems to us of little consequence, as practically its only effect would be to slightly increase the working expenses.

Underground London.

REFERENCE was made at a recent meeting of the Central London Railway Company to the obstacles, both artificial and natural, that were encountered in making some of the stations (which are twelve in all) and the tunnels.* In excavating within the area in front of the Royal Exchange the soil was found to be in a water-sodden condition, attributed to the Wall Brook, in its course from Moorfields to Lothbury, and then by Bucklersbury to Dowgate. There, too, they discovered what are described as the foundations of Gresham's Royal Exchange, and the vaults of a former Bank of England, which had to be chiselled out, bit by bit, that the works might be carried through. As regards the latter remains we may observe that on this spot stood, until about ninety-five years ago, two blocks, known as Bank buildings, separated by Threadneedle-street from the Bank of England, and from the (old) Royal Exchange by Castle-alley, which is plotted in W. H. Toms's plan, of 1760, showing the Exchange with a length of 154 ft. 6 in. between Castle-alley (west) and Sweeting's-alley (east). Nor does it appear that either Gresham's Exchange, designed by Henrycke, a Fleming, or its successor (by Edward Jerman and Cartwright), stood further eastwards than does the present structure. At Davies-street, Oxford-street, progress has been delayed by reason of a very large sewer that passed under the site of the station, to divert which occupied nearly twelve months. There they met with traces of another London stream, and had to adopt air pressure in the working. The Tyburn, flowing between the present Stratford-place and Gee's-court, crossed Oxford-street, and pursued its course down South Molton-lane and Avery-row to Hay Hill, and so to the Brookshot Field and Stone Bridge Piccadilly.

* See also the *Builder*, pp. 166-7, *ante*.

Changes at the Tower.

THE main-guard house at the Tower is being demolished for the erection on its site of more suitable and commodious quarters for the Tower guard. The site lies between Wakefield, formerly Hall, Tower (where the regalia has been kept lately) and the south-west angle of the keep or White Tower. That part of the Inner Ward that lay between the White Tower's south side and the curtain of the inner ballium joining the Wakefield and Lanthorn Towers, formed the outer court of the King's Palace. It was entered through Coldharbour Tower, standing (until about fifty years ago) close by the White Tower's south-west angle, on a large portion of the ground now being cleared. Along the outer court's south side, between Wakefield and Lanthorn Towers, stood Henry III.'s Great Hall—its site being, since, that of the Old Treasury House (see Lord Dartmouth's survey, 1681-9), pulled down in 1886*—on the court's north side lay the Jewel House, as in W. Hayward's and J. Gascoyne's plan of 1597. At the time (1726) C. Lempriere made his plan, engraved by J. Basire, the main guard had quarters in a building along the west side of the White Tower, and on the spot we describe stood the Stone House, formerly the Spanish Armoury, which was afterwards converted into a canteen, known as the "Stone Kitchen." The canteen gave place, in 1827, to the guard-house, which in its turn has now disappeared. A picturesque group of gabled and bow-windowed houses, with red brick chimneys and tiled roofs (known as "the Seven Houses of Office") situated between Wakefield and Coldharbour Towers, are mentioned as being then newly erected in the survey made in 1532, and were destroyed in 1827. They formed an interesting example of early sixteenth century domestic architecture. The survey cites also Coldharbour Tower, which had two drum towers flanking a gateway, being very similar to the existing Middle and Byeward Towers through which visitors enter the Tower.

Old Houses in Hampstead.

SOME old freehold property which is offered for sale as a building site, covering nearly 10,000 ft. superficial, includes three interesting houses—Romney's house and his painting-room and picture gallery, being the "Holly Bush" tavern, Holly-hill, and the adjoining premises now occupied by the Hampstead Constitutional Club; and New Grove House, in the Grove adjacent, which for many years was the home of the late

* See *Builder* of July 31, and (with illustration) August 7, 1886.

George Du Maurier. Hayley, in his "Life of George Romney," says that Romney first took lodgings at Hampstead in 1788, going each day to his house (then numbered 32) in Cavendish-square. In October, 1796, he bought the copyhold of the old red-brick house, assessed at 50*l.*, on "The Mount," in Heath-street. In 1799 he removed to some premises in the rear, which he had meanwhile built for himself on Holly-hill, opposite Holly-mount, comprising a large gallery for pictures and statues, some living rooms, and what Allan Cunningham describes as "a wooden arcade for a riding house in the garden." Romney spent in all nearly 3,000*l.* on his new home, having sold, in 1798, his house in Cavendish-square. Two years later he disposed of his property on the Mount, in Heath-street, in 1801, to one Mrs. Rundell, the widow of his tenant there; and in 1808 (six years after Romney's death) his residence at Holly-hill was taken by the Committee of the Assembly, or New Subscription, Rooms. The premises are now identified as the "Holly Bush" Inn, and the rooms of the local Constitutional Club—the large club-room, timber-framed, upon a brick basement, being Romney's gallery or studio, converted for purposes of the assemblies. The other parts of the club premises, including the parlour, kitchen, and offices, were added, it seems, about eighty-five years ago, by means of a tontine, for an enlargement of the then Assembly Rooms. The sale we mention extends to the large garden and the three old cottages adjoining.

The Paris Exhibition.

IN spite of recent bad weather, the works at the 1900 Exhibition have been actively pursued. The stonework of the large palace on the Champs Elysées has just been completed, and the constructional ironwork is about to be fixed. At the Champ de Mars and the Esplanade des Invalides the iron framework of the building is nearly completed. In the Palais des Machines M. Raulin is continuing the construction of the large Salle des Fêtes of the Exhibition. M. Louvet, the architect in charge of the intermediary portion of the palace of the Champs Elysées, will shortly commence the construction of the grand staircase of two revolutions, the whole of the decorative work of which will be forged in mild steel. M. Louvet is the first French architect who has ventured on the use of steel on such a large scale for decorative work, and the result will be looked to with considerable interest.

Johnson-court, Fleet-street.

FOR an extension of Anderton's hotel, and the rebuilding of some premises on the south and east sides of the court, there will be pulled down, shortly, a house that was occupied during eleven years by Dr. Johnson. He removed thither from No. 1, Inner Temple-lane, in 1765, and in 1776 quitted it for No. 8, Bolt-court, "still keeping," as Boswell says, "to his favourite Fleet-street." The house, having latterly served for purposes of the hotel staff, will, we gather, give way to new offices to be erected by the proprietor of the *Lady's Companion* and other publications. Whilst its front has been modernised and fitted with later casements, it remains within as it was in Johnson's time. The houses about to be pulled down have no back rooms, their inner walls are panelled, the stairs have massive balustrades, and the outer doors, it will be noticed, extend to the whole height of the ground-floors; some of the old shutters and the palings in front of No. 8—as depicted in J. Smith's drawing, 1834—may still be seen. In the interval of his residence in the court (it was not named after him) Johnson received the degree of Doctor of Laws from Dublin and Oxford Universities, made acquaintance with the Thrales, wrote the dedication to the King, of Gwyn's "London and Westminster Improved," was appointed Professor of Ancient Literature to the Royal Academy (1769), made his journeys to Scotland and the Western Isles, North Wales, and France, and gave asylum to Mrs. Anna Williams and Robert Levett. Dr. Johnson had seventeen different homes in London; of those that have been identified only two at present are standing.

GREEK ARCHITECTURE.*

THE IONIC AND CORINTHIAN ORDERS.

ALTHOUGH I thought I was bound to give you some lengthy extracts from Vitruvius in my three last lectures, I am not the less conscious that nothing is more dreary to listen to than rules of proportion.

As you have the translation of Vitruvius by the learned Newton, and the one by Gwilt in the Academy Library, I shall on this occasion merely refer to the books and chapter, if I have occasion, and leave you to read the passages yourselves. I may add that I consider it imperative on all architectural students to read through Vitruvius, and in the original text if they are Latin scholars. The careful study of Vitruvius lets us into the secret of how to proportion the whole building, and every part of it, and it is the adherence to this practice that has given, even to Roman buildings, so much repute; there is, too, a great deal of useful and practical information in the book, and much that is entertaining, but, besides this, it prevents our fancying that the present generation knows everything and can look down with contempt on antiquity.

No modern architect that I have heard of knows how to make music and singing heard by vast numbers in the open air by means of bronze vases under the seats, though the experiment was tried with earthen ones in the middle ages, but I believe without success; Wood says one theatre at Ephesus would seat 24,500 people. How few of us, too, would undertake to set out a sun-dial, build a city with its fortifications, give instructions in the making of cannon and the building of ships, as well as design those buildings which we are mostly called upon to do.

Those here who wish to read the Latin text at home, will find an excellent edition in small 8vo, published at Leipzic, for a shilling or two. On every folio of this volume the book and chapter are printed. This is a painful contrast to the scandalous way in which our publishers treat a book of reference; printed with wide margins, steel engravings, and with every appearance of cost and luxury. Gwilt's translation, for example, is 4to, published by subscription; to find out the book and chapter you want, you must look in the general index for the page of the book and hunt out the chapter. It has, it is true, a meagre index to the words, apparently printed from the MSS. without correction from the printed book, so that the pages are generally wrong. In fact great art has been used in most of the more costly architectural works to ensure the greatest waste of time to any one consulting the book: you are referred to the chapter which, being mixed up with the plates, is no easy matter to find; and to render it more difficult the number of the pages is always omitted next the print. There is rarely a verbal index and no description on the plate. I make no objection to a few copies being printed like this for those distinguished collectors who desire to leave behind them a large library of uncut books, but for the simple-minded who only use books for reading and reference, I think a description might be added to the plate as well as a good verbal index at the end.

* Professor Aitchison's fourth Royal Academy lecture, delivered on Thursday, February 9.

Although the question of how the Orders arose is not of immediate use to us, it is interesting, and the method that should be pursued in investigating such matters is important. I can best illustrate this by philology. When those of us who learnt the dead languages at school found in them a word resembling an English one, we at once came to the conclusion that the English word was derived from that language. This is not the way in which an etymologist proceeds. He traces back the word as far as he can in English, and he tries to find out what relation there has been between the two nations by conquest, intercourse, or books, or whether it has come through an intermediate nation; and has mostly to dismiss such resemblances as merely accidental, while it may so happen that words with no sound in common have been derived from the older language. For example, *heart*, from the Greek *κηρ*, through Roman cor cordis, and Saxon; the Roman C being either a guttural, as it now is in Tuscany, or converted into one by the Saxons.

In the same way, with architecture we must not jump to the conclusion that because two things are somewhat alike that the more modern must be derived from the more ancient.

There is a rock-cut temple in Egypt said to have been cut about 1800 B.C.; its columns somewhat resemble the Greek Doric, and there are also a few other similar columns of later date, hence the conclusion is jumped at that the Greek Doric came from Egypt, while it quite as possibly came from an adzed tree trunk. There are double curled vertical members on columns at Persepolis that look like two Ionic caps, a small one inside a big one, stuck on end. Nothing seems more plausible than this—that an ingenious Greek saw it and stuck one of them the right way up on a column, and there was the full blown Ionic. The only flaw in the argument is this—that beyond these two bare facts you have nothing to prove it; it is barely possible, though highly improbable, that it might turn out to be true, for fact is stronger than fiction; but until you can get all the connecting links I recommend you to dismiss it from your minds as nonsense.

The belief that the marble Greek temples took their rise from timber ones, probably arose from the contemporary existence of marble and timber ones. You remember that Pausanias, who lived about 174 A.D., saw at Olympia a wooden column said to be from that semi-mythical building, the Palace of Œnomaus, and another oak column actually doing duty in the Temple of Heré at Elis, besides other old temples of oak.

The true archæologist does not rush to the conclusion that because the stone forms ultimately used did not look like wood construction, that they could not have arisen from it, but racked his brains to see how he could get evidence of what the original forms were. Fortunately he hit upon the idea that ancient buildings might be shown on painted vases. He not only examined all the vases he could find, and all the good engravings of them, but got his architectural and archæological friends in other countries to do the same; this was no less a man than Hittorff, the French architect, and one of her Majesty, the Queen's, Gold Medallists, who built that fine station of the Northern Railway in Paris, and was one of the first who maintained the polychromy of Greek architecture. His researches as to the origin of the Greek orders were crowned with success, and he found that Doric and Ionic were both derived from pure wooden forms. The original Doric abacus was the bit of wood that every carpenter puts on a post to shorten the bearing of the supported beam, and the echinus was the cap to the post, the annulets were ropes, thongs, or withes tied round the top of the post to prevent it splitting. The cap was first sloped or rounded at each end, and then the whole cap was cut into a splay down to the shaft, not unlike the echinus we all know. M. Hittorff has not, it is true, found every step up to the time when the abacus was made square and the echinus round, though I dare say that might be done; but when the ultimate form was got in length, it was only a step to make it round, a step, too, that might be taken to-day by an intelligent carpenter who has got two beams, the halves of which overhang on either side.

The Ionic might have been developed in a precisely similar way, only the abacus there was much thicker and longer. It seems first to have been rounded at the bottom just as a

carpenter would treat it now, and then cut in a bit at the bottom, until at last some of those pelasgic spirals got painted, scored, or carved on, or in some cases an embossed strip of metal might have been fixed round it. A curious proto-Ionic has been lately found outside a rock-cut temple in Phrygia, published in the *Hellenic Society's Journal*, but there seems every reason to believe that the Ionic was evolved from the lotus capital of the Chaldees, and very probably from those at Cyprus.

Nothing is more curious than the fact that the only buildings which antiquity considered worthy of being classed amongst the seven wonders of the world were those of the Ionic order, and were in Asia, viz., the Artemision and the Mausoleum. Ionic was freely used by the natives of Greece, both on the mainland and in the Peloponnessus, as a subsidiary order, as in the Propylæa on the Akropolis at Athens and at Eleusis; in the opisthodomos of the Parthenon, in the Temple of Athene Alea, at Tegea (Pausanias Lib. 8, cap. 45), and in the interior of Apollo Epicurius at Bassæ, but for the exterior peri-styles of temples it seems to be mostly confined to those which might be called chapels. That on the Ilissus is only about 20 ft. by 40 ft., including naos, pronaos, and porticoes, while the Erechtheion and Athené Polias combined were only 35 ft. by 69 ft., exclusive of the portico of the latter, and the caryated temple on the south side. The Temple of Niké Apteros is but about 29 ft. by 20 ft., and it is not till we go to the Ionian colonies that we find temples of this order of any magnitude. Xerxes destroyed all the temples of the Greek colonies in Asia, and those of the mainland of Greece as far as Delphi, sparing this on account of the terror caused by a thunderstorm, when two crags fell down and crushed some of his men, and the Artemisium on account of its magnificence, *i.e.*, the sixth Artemisium, or the last but one preceding our Diana of the Ephesians; and it was to this temple that, according to Vitruvius, Metagenes first used Ionic caps. Besides the peculiarity and beauty of its capital the characteristics of the Ionic column are its deep flutings with fillets, its bases designed with peculiar care and originality, and turned, the slender proportion of its shaft, its entablature mostly without triglyphs (although there is one of Aezani in Phrygia with triglyphs) and mostly with dentils, and also its floral enrichments, sculptured as well as painted; however, the temple on the Ilissus is treated with the same simplicity and dignity that marks the Doric; there are no dentils, no sculptured enrichment except the "turnip stones" on the cymatium, that we call the egg and tongue, and two little honeysuckles between the volutes, and the pendent curve from the volutes in front; it has an epistylium without fascias. Those of the joint temples at the Erechtheion have no dentils either. One quite understands the sculptors, who were a most important body in Greece, objecting to be excluded from floral ornament, and preferring continuous friezes to the square metopes, as enabling a more complete story to be told, though the buildings and the sculptors lost by the exchange. The building lost greatly in composition and contrast by the omission of the triglyphs, *i.e.*, the vertical lines of the columns were not carried into the entablature, nor was there the proper contrast with its long horizontal lines, and the sculptor lost a foil for his sculpture.

As regards the base, the dominant idea was that of a vertical circular plinth; sometimes the lower torus projected a little, sometimes there was no lower torus, and the astragals, with their trochili receded; but the idea of verticality was always suggested. This can be seen in its crudest form in the remains of a large Ionic column at Samos (I could once have said, a glance at that church of Professor Cockerell near the top of Regent-street will exemplify my meaning, but that, alas! is no more).

The base of the order of the Temple of Heré at Samos, is a fluted torus on a concave circular plinth, horizontally fluted; that of the Temple of the Ilissus has a fluted torus, a flat, plain trochilus, and a plain torus. The Erechtheion has a precisely similar treatment to the last, only of different proportions. The Athené Polias at Athens has an attic base only, the upper torus is enriched with snare-work (a guilloche). The Apollo Didymæus at Miletus has a plain torus (possibly meant to be fluted) and three pairs of astragals divided by trochili. The Temple of Athené Polias at Priene is similar in treatment to the Apollo Didymæus only the torus is fluted. That of Bacchus at Teos is attic; that of Apollo Smintheos has a top and bottom torus with two trochili between, divided by a single astragal, and with fillets to the top and bottom toruses. The bases of the Ionic columns at the Mausoleum consist of a fluted torus three brace of astragals divided by trochili. The internal Ionic at Apollo Epicurius at Bassæ has a long and widely-spread apophagee, a plain and narrow torus, and the plinth hollowed in the shape of a reversed cavetto; most of the mouldings of these bases are exquisitely designed, and show great fertility of invention.

I have said a brace of astragals, but I am not sure that the two together were not the original moulding taken from the ankle bone.

We are doubly indebted to the Greek sculptors for claiming their rights over floral ornament, for they have not only preserved for us a great variety of ornament, but the ornament has better preserved the traces of the actual colour than marble or plaster, from which the colours have washed off in the case of marble, and faded on the plaster, when the plaster itself has not perished. I mean the interstices of ornament and points of leaves have preserved the colour there from perishing. The Erechtheum columns have a hypotrachelion left unfluted, and marked as well by a bead and reel at the bottom, this necking is delicately sculptured with what is called Greek honeysuckle.

The most perfect example of the Ionic cap is that of the temple of the Ilissus; it is equal to the finest Doric in exquisiteness of proportion, and is the most beautiful thing of which man can claim the invention. Who was the inspired architect we know not, but "so shines a good deed in a naughty world" that though his name has perished, he has filled millions with pleasure, and set up a standard of perfection that no succeeding architect has ever equalled.

The next in perfection is, perhaps, that inside the temple of Apollo Epicurius, said to be by Ictinus. He felt the inevitable blemish that occurs in bringing a spiral out of a straight line and curved the top; a lovely paraphrase of this by Professor Cockerell may be seen at the Taylor and Randolph buildings at Oxford. Next to these is that of Athené Polias at Athens, and then that of the Erechtheion.

One fancies that the architects of these two last temples had that on the Ilissus before them, and felt like Michaelangelo did about the dome at Florence. "Like you I will not, and better than you I cannot," and so tried to hide by ornament their failure to surpass it, for you know "the world is still deceived by ornament."

As soon as the volutes became small and the lower line straight, the capital became very poor. There is a curious thing in connexion with the Ionic which shows us that to man there is sometimes one necessary conjunction of line to form a perfect whole; doubtless the perfect attic taste deteriorated when it fell under the rule of the barbarous Macedonians. The culminating point of Athenian taste was in that comparatively peaceful period between the time when the whole nation returned victorious and exulting from their encounter with myriads of Persia, until the disastrous end of the Syracusan expedition. After the loss of freedom and power, evil habits and intestine broils completed the ruin of their highest mental powers. The degraded Ionic capital came through the Romans to the Italian architects of the Renaissance, who had probably never seen a perfect attic capital; their æsthetic instinct, however, felt the want of that pendant curve, and supplied it by a festoon between the two eyes. This was a much more clumsy way of solving the problem than the Greek, because that part between the eyes of the capital and the inside of the volutes had its continuity broken; but it was an overwhelming proof of there being only one solution and of the relative taste, training, and æsthetic perfection of the two nations. In many cases the Ionic owed more of its decoration to bronze and gold than the Doric, at least as far as we know; bronze pins and cramps as well as holes for them are found in the capitals at the Erechtheion, and were noticed by H. Inwood and Falkener; and we can almost be certain that the eyes there were of bronze, from that item in the bill of the cost which was cut in marble, viz., "Gold two petals have been bought from Adonis, who lives at Meleto, in order to gild the eyes of the columns, Drachmæ 2," and the eyes of the snare work of the caps were filled with coloured glass beads. According to the translation published by Priestley in 1844, Pausanias (Lib. 1, cap. 18) tells us that the Emperor Hadrian, in the Temple of Olympian Zeus at Athens, lined the walls of the porches with Phrygian stone—*i.e.*, with Pavonazzetto marble—and says:—"There are likewise habitations in these which are fabricated from golden reeds and alabaster stone." Mr. Frazer, who published his translation of Pausanias last year, does not mention the golden reed used in that place, but Wood found between two annulets of the Artemisium two slips of lead with some gold between, which also covered their face (this may be seen at the British Museum), and may have been the remains of one of these golden reeds which Hadrian imitated.

You know that in the temples of Pericles' time the Simæ of Vitruvius, which the Greeks called 'επιτίθιδες, on account of their resemblance to the beams on the ship's bows over which the anchor was cast, only crowned the raking sides of the pediments, just turned the corner, and stopped against blocks on the flanks, thus leaving the whole of the sides of the temples with dripping eaves; subsequently the Greeks and Romans of Asia Minor carried the crowning member along the flanks, forming them into gutters, and letting the water off by gargoyles in the shape of lions' heads. The real gargoyles were over the centres of the columns, so as not to wet those coming through the intercolumniations, and the rest were dummies.

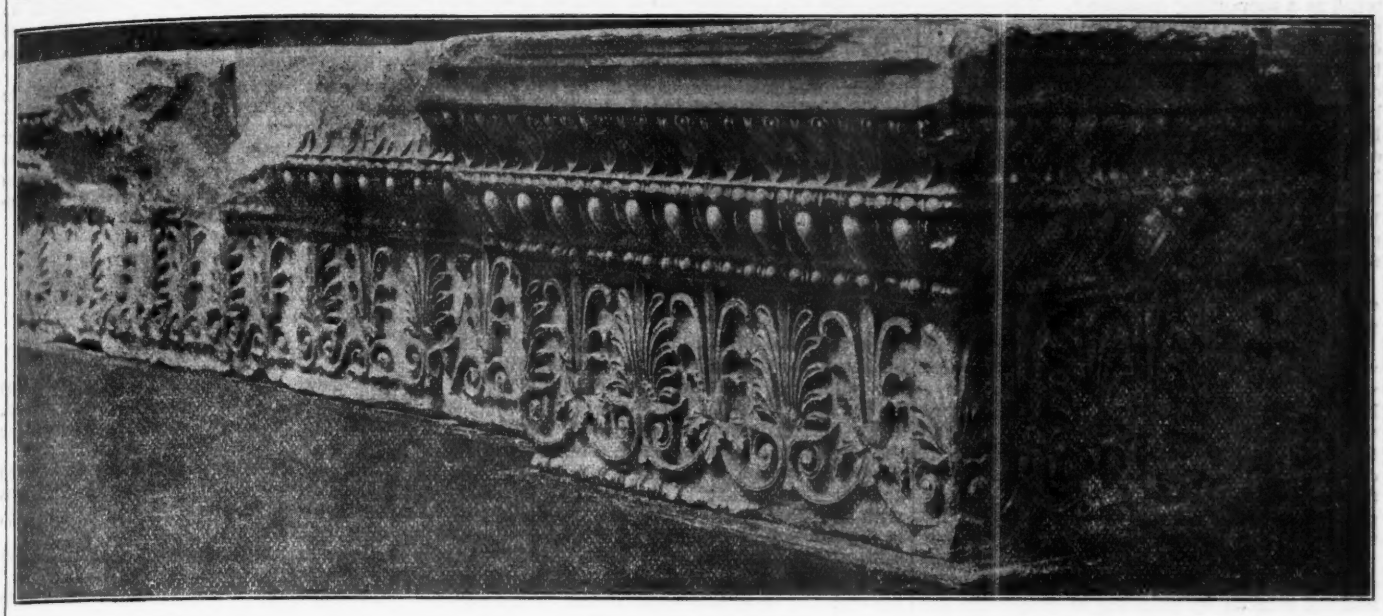
These are Vitruvius' words (Lib. 3, cap. v., sect. 15), "In the Simas, which are above the coronas on the flank of the temples, lions' heads are to be carved, and so placed that one over each column may first be placed, and the rest equally spaced, so that each one may correspond with the centre of each tile. Those, however, which are over the columns are to be bored through to the gutter which receives the rain-water from the tiles. The middle ones are to be solid, so that the abundance of water which comes into the gutter from the tiles may not be poured down in the intercolumniation, nor drench those coming in; but those which are over the columns may be seen to vomit forth water from their mouths."

Fergusson, who had overlooked this passage, gives an opposite reason for the arrangement of the internal columns at Apollo Epicurius. He says: "The object, however, of this arrangement becomes apparent at once, if we assume that they desired that the principal drainage of the roof should fall between the external columns, not against them, so as to corrode them, as otherwise it would inevitably do" ("Principles of Beauty," page 388).

I may here mention that Herr Puchstein, in his learned treatise on the Ionic order, informs us that the early abacus was flush with the channel of the pillow and the volutes, *i.e.*, the whole was flat to the cymatium, and the cincturas were painted. He believes the attic examples of the cap were developed by potters from a painted edging, afterwards worked in stone, but those of the Peloponnesus from a metal strip fastened round, the pendant curves being left plain on account of the difficulty of junction with the volute; and he dwells on the difference between the fluted bolsters of the Athenian example as compared with the central girdle of the Asiatic type, as it is in treating of the foundation of columns and the Ionic order that Vitruvius (Lib. 3, cap. 4 and 5) mentions the *scamilli impares* which so long baffled the ingenuity of architects and scholars; and, as it is the prerogative of English architects to have solved it in this century, I may as well give you some account of them.

Wilkins published his partial translation of Vitruvius in 1812, and, as he rightly understood his author, I give the extracts from his very free translation.

"The stylobate ought not to be constructed upon the horizontal level, but should rise gradually from the ends towards the centre, so as to have there a small addition. The inconvenience which might arise from a stylobate thus constructed, may be obviated by means of unequal scamilli. If the line of stylobate were perfectly horizontal, it would appear like the bed of a channel." The method of constructing the scamilli, and the application of them, is explained by a figure at the end of the Book xx. "In placing the capitals upon the shafts of the columns, they are not to be arranged so that the abaci may be in the same horizontal level, but must follow the direction of the upper members of the epistylium; which will deviate from the straight line drawn from the extreme



Frieze of Erechtheion.

points in proportion to the addition given to the centre of the stylobate" (vol. i., pp. 21, 22, and 25).

To Wilkins, therefore, must be attributed the merit of first translating these passages properly, and putting architects on the right scent.

The late Mr. John Pennethorne, who was at Athens in 1832 and 1834, and was investigating the delicacies of Greek proportions and mouldings, and taking the curves of the mouldings, &c., in wax (with whose valuable book you are all probably familiar), then being on the look-out for such things, and had probably read Wilkins' translation, noticed the convex curve of the steps and stylobate of the Parthenon. The Greek Government having partly disencumbered them of the ruins that hid them in Stuart's days. The same convex curve had been observed by Messrs. Ross, Hansen, & Schaubert, Austrian architects, who were there, and they and Mr. Pennethorne worked at this together. In 1837 he again visited Athens, did what he could to get the levels, for the steps were not even then wholly disencumbered, and published a letter on the subject, and, in 1844, a pamphlet. Mr. Penrose subsequently went out and ascertained with extreme accuracy the the exact measurements, and then calculated the curves which were published in his book on the Parthenon in 1851. Thus, by the sagacity of Wilkins, the trained observation of Mr. Pennethorne, and the energy, care, and mathematical attainments of Mr. Penrose, we are able to see how and why the Greeks attained their celebrity, and have read us and the world a lesson that, besides genius, exquisite care, and elaboration, is necessary to ensure undying fame. It is, I think, worth our while to hear what Plutarch says on this subject in his life of Pericles, written some six hundred years afterwards.

"It is said that when Agatharcus, the painter, valued himself upon the celerity and ease with which he despatched his pieces, Zeuxis replied, 'If I boast, it shall be of the slowness with which I finish mine. For ease and speed in the execution seldom give a work any lasting importance or exquisite beauty; while, on the other hand, the time which is expended in labour is recovered and repaid in the duration of the performance.' Hence we have the more reason to wonder that the structures raised by Pericles should be built in so short a time, and yet built for ages; for as each of them, as soon as finished, had the venerable air of antiquity, so, now they are old, they have the freshness of a modern building. A bloom is diffused over them, which preserves their aspect untarnished by time, as if they were animated with a spirit of perpetual youth and unfading elegance."

The ruffian Lucius Mummius wantonly destroyed Corinth about 146 B.C., though it is said he was ordered to do so by the Senate; so we must let them share the infamy between them. If Corinth was the original birthplace of the Corinthian order, the Roman Senate and Mummius between them destroyed every vestige of its beginnings, for they even rifled and dug up the tombs; we, of course, think nothing of this now, but in those days it was considered even more sacrilegious than to sack and destroy the temples. The gods could avenge insults, but the unhappy ghosts were condemned to wander howling on the earth till their bones were buried.

I give you Vitruvius's history of the invention of the Corinthian order, which I have translated myself, to give some of the original quaintness, for, though I fear it is not true, it is certainly pretty (Vitruvius, Lib. 4, cap. 1, sec. 9).

"A maid, a citizen of Corinth, of marriageable age, stricken by disease, died. After her burial, her nurse collected those things in which she delighted when alive, put them in a basket and carried them to her grave, and put them on the top of it, and so that they might last the longer in the open air, she covered the basket with a tile. This basket by chance happened to be put on the root of a thistle. The root of the thistle, pressed by this weight, about spring time brought forth its middle leaves and stalks, its stalks growing to the shape of the sides of the baskets, and, being naturally kept down by the corners of the heavy tile, the ends were forced to curl themselves into volutes. At this time Callimachus, who, because of his elegance and subtlety in the marble art, was called the 'enervating polisher' by the Athenians, passing by the grave, noticed the basket and the growing tenderness of the leaves around it, pleased with the novelty and distinction of its shape, made from it a model for columns among the Corinthians."

Callimachus is said to have lived before 396 B.C., and made the golden lamp in the Erechtheion; hence it has been suggested that the leaves of the Corinthian caps were of metal. At such a late date as this it is impossible that very many Greeks should not have seen Egypt, Persepolis, and Babylon, and hence have seen many belled caps covered with foliage, though it may have been the prerogative of Callimachus to have added an abacus and a volute. This, however, could not have been the case if Ictinus built the Temple of Apollo Epicurius at Bassæ, and used the Corinthian cap there found, for he lived during the supremacy of Pericles, 444-429 B.C. It was, however, invented by some one, and it does not much matter to us now whether he was a Greek, a Phrygian, an Egyptian, a Persian, or a Jew.

Pausanias (Lib. 8, cap. 45), speaking of the Temple of Athené Alea at Tegea, says of the new temple:—"The first ornament of this temple is a triple series of columns, the first of which are of the Doric order; the second of the Corinthian, and the third, without the temple, Ionic, and he before tells us the old temple was burnt 392 B.C. At present it seems hopeless to attempt to give any dates to the remains of the Corinthian caps we have, except to that of the Choragic monument by Lysicrates, about 335 B.C. Here is a fine opportunity for some enterprising young architect who is both an archæologist and scholar to write a monograph on this subject. From the delicacy of the ornament and the undercutting of the Corinthian capital, nothing generally remains but the attached parts of the leaves, and the stumps of the volutes, and caulicoli.

The main ones that are known are, first, the cap of Apollo Epicurius; second, a capital from Apollo Didymæus at Poseidon. This was a capital of one of the attached columns on either side of the door, from the first chamber into the naos, and was inside it; it looks like a late specimen; but the caulicoli are very small, and their tops are about one-third of the height of the bell below the abacus, and the honeysuckle which springs from it finishes below the abacus; the top member of the abacus is carved with the egg and tongue, and the necking is carved into a bead and reel, and all the foliage is of the Greek type. In that at the end of the naos at Apollo Epicurius, at Bassæ, where the abacus was square in section, the caulicoli are attached to the bell just above a row of dwarfed leaves above the necking, with a honeysuckle at the top; third, the Corinthian capital of a pier or pilaster of the entrance to the sacred enclosure of the Temple of Demeter and Persephone at Eleusis. This is a curious example, as instead of the abacus being hollowed out from angle to angle, it is in front hollowed out with two flat curves to the centre, under which is a honeysuckle, and the volutes are replaced by griffins; there are the floral caps of the astronomical building of Andronicus Cyrrhestes, who is supposed to have lived 159 B.C.; but these are only capitals of subsidiary columns, forming the porches in front of the doorways, and, being remarkably ugly, have been much used in modern times. The little Choragic monument of Lysicrates has many peculiarities to which I may draw your attention. The flutes of the columus finish as leaves, and the capitals doubtless had bronze neckings; the abacus is a deep trochilus. The foliage of the cap is by far the most graceful of anything that has come down to us, and the paterae between the leaves rather suggest metal. A beautiful copy of this once graced a ground floor in Cheapside, and was a delight to look on; but the house had to be rebuilt, and the new architect, feeling he was by no means equal to such work, pulled it down, and built some common-place design of his own. I have not the faintest notion of who the first or second architects were, but I used to think that there was no well-known architect but Professor Cockerell who could have designed the first.

The entablature of the Choragic monument is peculiar in many ways; the architrave is very deep, though the frieze has sculpture; this depth was probably for structural needs. To lessen its apparent height, the fascias of the architrave are sloped inwards at the bottom instead of outwards in the usual way. Looking at this little monument on paper, one is apt to find fault with some of the profiles. The cymatium of the frieze is a big astragal, while the first member of the cornice over it is a heavy ovolo. The moulding over the dentils is a cyma recta, with a small cyma reversa over it. A cyma recta always looks

weak as a supporting moulding. The monument has no crowning member above the cymatium of the corona, but just set back, behind its fillet, is a scolloped edge. The tops of the scollop are supposed to have been honeysuckles; and behind that again, and a little above it is a line of waves, so that the effect is like the two lines of pierced woodwork beneath the eaves of a Saracen house, turned upwards. The tholus or dome is carved into leaves, and on these are the magnificent scrolls which rise up to support the floral base for the bronze tripod the owner had won.

It has been the fashion of late to decry the caryatid portico of the Pandrosion, though nothing more beautiful has ever been done.

Here I only want to point out a Greek device which you should all bear in mind. The figures would be squat for columns and wanted a heavy entablature, and this was made more than one-third, *i.e.*, ·384 of the height of the figures. This would have looked mean if divided into three in the ordinary way, so they suppressed the frieze and its cymatium, put dentils above the cymatium of the architrave, and enriched its upper fascia, for it has three with pateræ, so that it almost looks like a frieze. You should bear this lesson in mind and not weaken by reducing in proportion but by omitting one or more members. I do not know that I ever saw any account of how the Greeks treated the Corinthian capital with colour.

I have reserved pilasters (*παραστασεις*) to the end so that they might be treated together, whether they belonged to the Doric, Ionic, or Corinthian order. We all know that the Romans and their imitators merely used a flat order, and some of the architects of the Renaisssance, especially in the Northern countries, not content with putting entasis enough to their columns to make them like attenuated barrels, kept this entasis on the pilasters and diminished them as well; though ugly isolated shafts, swollen in the middle, are scarcely bearable, a swollen pilaster bounded by sloping curved lines is quite unbearable, not to speak of the dulness and ugliness of a round thing flattened into a square one. Its use bespeaks that poverty of invention that excites disgust. The pilaster originally was the end of the wall of the pronaos, made a little wider than the wall to show returns on both sides.

Supposing the Greeks did at first try a flat cap like that of the columns, two things were at once obvious: first, that it projected beyond the abacus of the columns, as it came from a vertical face and not from a receding one; next, the main beauty of the Doric capital arose from the shadow of the square abacus falling on a curved circular surface, and consequently you lost in the pilaster the bay of light on the echinus, and the angular shadow from the corner of the abacus. Herr Puchstein believes the cymatium was first introduced from the cornice to pilasters.

In the Parthenon, the pilasters range with nothing except the flanks of the pronaos and posticum, and are about one-third the width of the columns. The portico of the pronaos is prostyle; the pilaster capital is not quite equal to the abacus of the order, and the capital and fascia below it are together not much more than two-thirds of that of the order to the necking; the abacus has a small ogee for its cymatium; below it there is a hawksbill, and then two flat ovolos, then a fillet and bead. The lower ovolo is carved with the egg and tongue, and the astragal with the bead and reel, and one deep fascia of slight projection finished it. The bottom of the pilaster is without a base.

The temple of Artemis Propylæa at Eleusis and Themis at Rhamnus are both *εν παραστασι* At Artemis Propylæa the capital of the pilaster exclusive of its fascia is about level with the centre of the echinus of the column, and consists of a chamfered cymatium to the abacus, a hawksbill whose hollow or return makes a cyma recta, a splayed fillet, and a long hollow to the necking with two projecting annulets. The necking is a plain fascia above the necking of the columns. These pilasters have a moulded base consisting of an astragal, a cyma reversa, and a shallow plinth. You should note the utter disregard of the lines ranging, provided the whole looked well.

It is not worth while describing every variety of Doric pilaster.

At the temple on the Ilissus the only pilaster that shows in conjunction with the order is a narrow strip not one-third of the width of the column, the mouldings of whose cap and base continue the whole length of the flank of the wall; the cap is composed of an abacus whose cymatium is a narrow astragal and fillet; under it is an ogee and bead; under this is an ovolo and bead, and a deep fascia whose bottom is a little below the column cap; at the top of this fascia a fillet is introduced, forming a band under the lowest bead of the cap. The base is similar to that of the columns, viz., a fluted torus, a trochilus, and a plain torus; but this torus does not correspond with that of the column, but is little more than a big astragal, and the top of this base is nearly on a line with the middle of the upper torus of the column. At the Erectheion the flanking pilaster is only about one-half the width of the column, and the mouldings of its cap run right along the naos wall, and it does not correspond with height of the necking of the column, with the the bottom of the volute, nor with the bottom of the capital; it consists of a plain shallow abacus and cymatium, an ogee carved with those leaves the French call *raie du cœur*, a bead and reel, an ovolo carved with egg and tongue and another bead and reel; the necking is carved with the same ornament as that of the necking of the column, and is finished with a bead and reel.

At the Caryatid Temple the pilaster goes through the stylobate right down to the continuous base of the naos, and the stylobate finishes against the shaft of the pilaster. The Propylæa at Priene is an Ionic tetrastyle and amphi-prostyle building. All the internal supports are square piers; pilasters are arranged along the outside of the walls, while the column cap is only about 10½ in. deep and only about 1 ft. 2 in. to the bottom of the volute; the pier and pilaster caps are 2 ft. 1 in. deep; they are treated with very small volutes with two griffins facing a trophy on the flanks. On the face they have a full-length figure coming out of a base of leaves and holding tendrils in each hand, which come from the sides of the same base. The same caps are used to the pilasters on the flanks. Paraphrases of these caps were once to be seen on the Regent-street chapel by Professor Cockerell, now pulled down. The internal pilaster caps at Apollo Didymæus are similar in shape, though wider and shallower, and have the central part between the volutes filled in with graceful foliage of the honeysuckle type, or with griffins. Those of Athené Pclias, at Priene, are similarly treated, one of which may be seen at the British Museum, so we may conclude this was the usual practice in the Asiatic colonies.

The only pilasters of the Corinthian order that are known are those to the doorways of what is vulgarly called the Temple of the Winds; like the columns, they have no base, and the caps consist of uncarved mouldings of great projection. My chief reason for dwelling so long on pilasters was to draw your attention to the inventiveness and artistic culture of the Greek architects.

In the outside of the temple or building itself the architects seemed to be confined to the following of a certain unmoveable type; the utmost allowance they enjoyed was the slight variation of form in the details; but in all the subordinate parts perfect freedom was given to invention and to what we might call the infringement of rules; all that seemed to be asked of them was to make the whole perfect, and such was the complete mastery over their art that the architects possessed, that columns of various heights and dimensions were used, as at the pronaos of the Parthenon, or the Ionic or Corinthian order was introduced in conjunction with Doric or Ionic, as at the Propylæa of Athens and Eleusis; and in the entrance to the sacred enclosure of the Temple of Demeter at Eleusis. At Apollo, at Bassæ, we have the Ionic and Corinthian together. I think that using of the Ionic, because it was more convenient at the Propylæa, is a boldness that we could only expect from a thorough master of his art; but it does not strike me as a thing that a modern master might not have done. To have the knowledge and boldness combined to have left out the frieze, and made the cornice heavier at the caryatid portico, is a boldness of instinct that we could only doubtfully ascribe to a modern who had, be it remembered, never seen such an expedient adopted before.

To carry down the pilaster so as to mark the caryatid portico as a projection from the main building might have been done by any one who was a master, and subservient to strict induction, but to dare to use the same order on two steps, to make it smaller, to carry it up higher as in the pronaos of the Parthenon, seems to me an audacity that no one would be guilty of whose knowledge was not the most profound, and whose instincts were not verging on artistic perfection.

I think we ought to express our thanks to the Dilettante Society and to Mr. Penrose for clearing up the vexed question of Jupiter Olympius at Athens, which has been the cause of much waste of labour, and much irritation at least from 1486, when the codex of Vitruvius was first printed, to the year 1887.

ROYAL INSTITUTE OF BRITISH ARCHITECTS:

MUNICIPAL AND PUBLIC LIBRARIES.

A GENERAL meeting of this Institute was held on Monday evening at 9, Conduit-street, W., Professor Aitchison, R. A., President, in the chair.

Mr. W. J. Locke, the Secretary, announced the death of Mr. James Murray, who was elected an Associate in 1851, a Fellow in 1867, and retired in 1889.

Papers were then read by Mr. J. M. Brydon and Mr. F. J. Burgoyne on "Public Libraries."

Mr. Brydon explained that his object was to show, with as full illustrations as possible, something of what had been recently done in library building, so that one might learn what to follow in the future. A suitable site was of primary importance. It should be central and prominent, yet quiet; ample in area to allow for future extension; have a good light all round, and be dry.

As regards the building, the free and open system of the ordinary popular library—*i.e.*, reference and loan, combined with reading-rooms—rendered proper supervision essential, and as libraries are usually understaffed, the arrangements of the plan must be concentrated so as to enable the officials to supervise at a glance all the rooms to which the public have access. An ideal plan is to place all the public rooms on one floor. Where this cannot be done, the rooms to which most frequent and rapid access is required should be placed on the ground floor, and those less frequented on an upper floor. The administrative portion of the library, such as the book stores, the librarian's office, and the workrooms for his staff, must be conveniently placed for the service of the department to which they are more particularly attached. The public rooms should be lofty, well-lighted, and thoroughly ventilated.

The planning of a public library is not, however, a complicated problem. The requirements are comparatively few and simple, and lend themselves to a stately and architectural system of design from which some striking effects almost necessarily follow. It must be endowed with a fitting dignity, both in plan and elevation. The reading-rooms, being large, give ample scope for the designer's knowledge of proportion. They should possess that quiet dignity of effect which can only be obtained by good proportion and restraint in design. Fussy little bay windows and other nooks and corners are uncalled for and out of place.

Respecting the lending department, the author considered that an architectural opportunity had been missed in many recent English libraries. Instead of being simply a book store, with a space cut off for the public, the latter might be treated as a hall or lobby by itself, as in some of the American libraries, notably at Boston. There the delivery room is 64 ft. long by 33 ft. wide and 20 ft. high, and is decorated in the most sumptuous manner. Adjoining it is the stack room, to all parts of which application slips are sent through pneumatic tubes. The books come back to the alcove by means of a little electric railway with low wire basket carriages, running at the rate of 500 ft. per minute. The delivery room at the Edinburgh Public Library* (Mr. G. Washington Browne, architect), is modelled on the telling-room of a Scotch bank. The central space is devoted to the public, with counters round three sides, and alcoves behind them for the storage of books. This arrangement gives scope for, and is treated with, considerable architectural effect, a handsome hall being the result. The public library of the future will be the centre of culture and enlightenment of the district in which it is placed, and will wield an influence which must ever become wider and stronger. The building

* For illustrations of this building, see our issue for July 16, 1887.

should be of such a character as to assist this influence. The suburban villa type, with its useless turrets and bay windows, should be altogether discarded—in short, the building should be endowed with that distinction of style and nobility of purpose which will render it an enjoyment and inspiration to all who hope for the growth of a living interest in architecture as a fine art.

Having briefly referred to the arrangement of rooms in libraries recently erected in the United Kingdom, plans of all of which were shown, the author turned to the great American libraries, describing in more or less detail the buildings, plan, and notable features of the Congressional Library at Washington, of which an interesting historical sketch was given, the Public Library at Boston, the Columbia University Library, New York, and the public library about to be erected in New York.

The American Government had commissioned American sculptors and painters to the number of fifty to decorate the Washington Library. The result was the most interesting record possible of the scope and capabilities of American art; not only sumptuousness of design, but richness of materials had been pressed into the service — marble, bronze, mosaic, fresco, and choice woods all bear their part. Staircase, hall, and rotunda, or reading-room, are a blaze of rich marbles and decoration. In the rotunda the columns and pilasters of the piers carrying the dome are of red Numidian marble resting on pedestals of dark purple Tennessee marble, their capitals being gilded. The screens between the piers are of yellow marble, and the portrait statues which surmount the balustrade are of bronze. The building is 468 ft. long from north to south, 340 ft. deep from east to west, by 72 ft. high. The rotunda is 100 ft. diameter, 125 ft. high to the top of the dome, and 160 ft. to the domed ceiling of the lantern. The architects were first Mr. Smithmeyer, then General Casey, Mr. Bernard Green, and Mr. Pelz. The building cost 1,272,000*l.* sterling.

The great architectural features of the Boston Library are the Staircase Hall and the Bates Hall—the former notable for its mural paintings by M. Puvis de Chavannes, illustrating Philosophy, Astronomy, History, Chemistry, Physics, Pastoral, Dramatic, and Epic Poetry. Bates Hall is the reference reading-room; it is 218 ft. by 42 ft., and 50 ft. high to the crown of its arched ceiling. It has accommodation for 264 readers at thirty-three tables. Sargent Hall, named after the eminent painter, is 84 ft. long, 23 ft. wide, and 26 ft. high. The ceiling is vaulted, and the hall is lighted from the roof. The decorative painting will be entirely by Mr. Sargent; the scheme, representing the Triumph of Religion, illustrates certain stages of Jewish and Christian history. Some of the work was shown at the Royal Academy in 1894. The interior court, another charming feature, is surrounded on three sides by an open arcade of white marble, similar in design to that of the Cancellaria Palace in Rome. In its centre is a marble fountain, set about with grass-plots; along the walls under the arcade are low oak benches, so that on warm days the court may be used as an open-air reading-room. The building is a careful study of Renaissance thoughtfully and lovingly carried out, reflecting the greatest credit on its architect, Mr. McKim, and the public spirit that called it into being. Many interesting facts and figures in connexion with this library and the branch libraries at Boston were given by the author.

The third library called attention to—that of the University of Columbia, New York—was built and presented to the University by Mr. Seth Low, President of the University, as a memorial to his father. Construction and equipment have cost nearly 240,000*l.* The architects were Messrs. McKim, Mead, & White. In plan it is like a Greek cross, with the great reading-room at the intersection of the arms, and covered by a dome. It has a magnificent approach of terraces and steps leading up to a noble entrance portico of ten Greek Ionic columns. The entrance-hall is adorned with splendid marble columns. The building, of which many interesting details were given, may be taken as an example of a typical University library worked out on modern lines to suit modern requirements—a utilitarian scheme artistically carried out.

The public library about to be built in New York was the subject of a limited competition last year, and copies of the successful design, lent by the architects, Messrs. Carrère & Hastings, were exhibited in the meeting room. In its main lines it somewhat resembles the Boston Library, but in the instructions was this distinction, that though the authorities did not object to external splendour they were rather disposed to favour a simple interior. The winning design has resulted in a good plan, and what promised to be a stately, dignified exterior. A marked feature is the raising of the building on a great terrace. The architects were not content with designing the building alone—it must have a dignified setting; so by means of broad flights of steps, terraces, fountains, and votive columns, the approaches were made to contribute to and enhance the effect of the architectural picture. This, the author thought, was a point to which more attention should be paid in public buildings in England.

In conclusion the author expressed the hope that these American works were not without their lessons for us in more senses than one—not only as libraries, but as public buildings. Would that some of the public spirit and the love of art which animated the founders and designers of those works could be transferred to the hearts of the City Fathers of London and our great provincial towns!

Mr. F. J. Burgoyne then read a paper on the same subject. He commenced by making some observations on the limited income derivable by municipal libraries from the rates, urging that the initial charges for buildings and sites should be paid out of the general rates, and the whole proceeds of the penny rate be available for the current work of the library. The plan of the building should be considered, not only in relation to the public, but also to the probable size of the staff to be engaged. Dividing municipal libraries into three kinds—small, medium, and large—the author indicated the minimum accommodation that should be provided for staff, books, and public, illustrating his points by reference to plans of existing buildings, a large number of which were shown by the lantern. For a small library, the plan generally adopted is a rectangular room, lit chiefly from the top, with newspaper stands and tables in the centre; the walls on one, two, or three sides shelved for books, 15 ft. to 18 ft. in height, and a counter or rail running round the room 6 ft. or 8 ft. distant from the books. Libraries of medium size require a quiet room where books of reference may be consulted. Such a room may be combined with one for reading the higher-class magazines and reviews. If the public rooms are all on one floor, the reference books will be shelved alongside those of the lending department. If on two floors, the reference department is placed upstairs, and the lending and general newsroom on the ground floor. In the larger libraries the work done in the reference department is of the most valuable character, and it is advisable to have, in addition to the ordinary reference reading-room, a smaller room for the use of students of special subjects, or those who are engaged upon original research. The librarian should have a room for his own use—one that may be used if necessary for the meetings of his committee. In large libraries there should be a fireproof strong-room on the same floor as the reference department, in which the rarer books and MSS. can be stored, and rooms for repairing and binding books. There should be mess-rooms for the staff and suitable lavatory arrangements.

The author recommended that before planning a building a clear idea of the method of work to be employed should be obtained from the librarian. The various methods of issue — with indicator, without indicator, and "open access"—require different accommodation and different arrangements, all duly described by the author.

In shelving the books in the lending department, it is important to place them as near the issue desk as possible, in order to facilitate quickness of issue. Reference books, the author considered, were best shelved in a store-room adjacent to the reference reading-room. Room must be allowed for growth in this department. It was estimated that in the larger libraries stock would increase threefold in twenty-one years. To cope with such an accretion the author favoured the adoption of the American "stack system" of packing the books, combined with rolling book-cases for works in least demand. This system was described by the author, and plans and sections were shown of the stack systems in the libraries at Grieswald, Halle, and Strasburg.

The new system of sliding presses in use at the British Museum consists of stacks three tiers in height and about 9 ft. apart. In front of each bookcase a couple of steel girders with flanges are bolted to the iron floor above, at a distance of about 36 in. from each other, and at right angles to the case. From these girders hang a bookcase of the same width, to within a few inches of the floor. It can be filled with books, and is readily pulled away from its normal position close against the front of the fixed bookcase. It can be adopted piecemeal as the necessity arises for greater accommodation in any particular section of the library. A somewhat similar system is in use in the Library of the India Office. The iron book-cases hang from girders, as at the British Museum, but are packed close together, and if a book is wanted the case containing it is pulled out into the central gangway, which is the same width as the sliding case. This is the closest method of shelving yet devised, and very useful for books not much in use. All shelves should be of the same length—36 in. is the most convenient length. No bookcase should be higher than 8 ft.—7 ft. is preferable.

Mr. F. Pacy, the hon. secretary of the Library Association, said that librarians should congratulate themselves if architects could be induced to see that there is a field for the exercise of their abilities in connexion with libraries. Nothing could be more fatal to the usefulness of a public library than a badly-constructed building in an out-of-the-way place; but a building with bright and attractive rooms, well-ventilated and arranged, was almost sure to be a success. It had been said that it was an ideal arrangement to get all the apartments of a library on the ground floor, but that was not always possible. As to the storage of books, he was not in agreement with Mr. Burgoyne when that gentleman said he preferred storage room as distinct from a reading room. His (the speaker's) sympathies as a librarian were with the arrangement which showed the treasures of a library round its walls, and he thought there was no better furniture or decoration for a library, with all respect to decorators and artists, than books. There was nothing which gave a greater air of comfort to a library than its books. The warming of public libraries was almost invariably done by hot water or steam, the radiators and pipes being placed close to the walls of the building. The effect of that was that often no warmth was obtained at all, as the librarian was obliged to cover the radiators and pipes with bookshelves, and the books suffered in consequence. If architects would warm such buildings from the centre of the rooms that would be a great gain and would remove a defect which was noticeable in many libraries in the country. The question of supervision by the librarian was an important point; but he thought that the result of the librarian and his staff being in the centre of the building, in order to see all that occurs, was often bad from a health point of view. As a consequence, they had to breathe the vitiated air which was all too frequent in a library. He thought that more in the way of tiles or marbles and washable materials might be used in the construction of libraries, which would enable them to dispense with the frequent closing of such buildings for periodical cleaning and decoration. That would be a saving in expense, as well as removing much cause for annoyance. He sympathised with Mr. Brydon's peroration, and said it was a remarkable fact that in this country, which had a literature as old as its history, we had so neglected to provide palaces of learning such as they had erected in America, where their literature was comparatively new.

Mr. J. H. Quinn, Librarian, Public Library, Chelsea, said that it was a great mistake for Library Committees to cut down architects' plans, as they often did. They often did not realise that the needs of a parish would grow, and that they could not build a new library every year. It was desirable to leave space on a site for future extensions of a library, though that was more a question for the authorities than for architects.

Mr. H. H. Statham, in proposing a vote of thanks to the authors of the papers, said that Mr. Brydon had shown that public libraries afforded opportunities not only for utilitarian treatment, but for beautiful architectural treatment as well; while Mr. Burgoyne had satisfied them that the business of librarian did not deaden the sense of humour. Mr. Brydon had referred to a library in which all the windows were closed and air-tight, so as to prevent the entrance of dust; ventilation being supplied by

other means. But if the windows were closed in order to prevent dust coming in with the ordinary air, what was to prevent dust coming in through the ventilators? If the air were forced through a number of tubes—which were difficult to get at—it seemed probable that there would be more dust than if the air were allowed to come in by the windows. In reference to the Liverpool Library, it was an instance of architectural considerations coming before utilitarian ones. The circular library was built as a sort of monument to Sir James Picton, and it served to connect in a very effective manner, the existing buildings which stood at different angles. But the circular reading room was one in which almost every whisper could be heard, though he thought that, if the scale had been larger that would not have been the case, for in the British Museum, where there was a great deal of unnecessary conversation, the conversation was not very noticeable. As to the materials used for reading rooms, generally the floor was laid with something to prevent the noise of feet. That told rather against keeping the place clean, and he thought it would be almost better to lay down merely strips of material to walk upon. These would be easy to take up and the floor could be regularly washed when the library was closed for cleaning. He remembered a very ingenious suggestion for a library made many years ago by their member, Mr. Fawcett, and which received the unusual honour of illustration in the *Athenæum*, which did not generally publish illustrations. It was a proposal for enabling a library building to be increased *ad infinitum*. It was to commence with a simple circle, to which was added, as occasion arose, a spiral, with cross doors connecting it at right angles. As the need for additional storage of books was felt, the spiral could be continued as far as was required. It was an exceedingly ingenious idea, for the indefinite extension of a library, though he did not know that anything had ever come of it.

Mr. Beresford Pite, in seconding the vote of thanks, referred to the Ryland's Library at Manchester—a very interesting and costly building, he said, which almost baffled description. It was so entirely exotic: it had a gorgeous fifteenth-century vaulted hall, covered with elaborate tracery; deep bays vaulted in stone, with elaborate traceried windows and corridors; and there was a minimum of daylight and the ordinary external air was carefully excluded. He had heard the architect, Mr. Basil Champneys, explain the system by which the external air was excluded—only being admitted through a ventilating trunk and after it had been washed, purified, and cleaned. The air to be admitted into the interior of the building, was, in fact, dealt with very much in the same way as the air of the House of Commons. There was a great deal of architectural difference between buildings for this modern "stuffing machine"—this reading by the assistance of the penny rate—and the comfortable home-like charm which one liked to associate with one's own study or in the hall of a college. The glazed material recommended by Mr. Pacy quite accorded with that idea. The needs were different, and had to be dealt with differently. As to ornament and decoration in crowded and stuffy rooms, one felt little inclined to embark upon architectural fancies for such places, and the only part of an ordinary library left to the architect was the main staircase. He did not feel at all happy with what had been done with recent library buildings in this country. Architects seemed to be altogether at sea, using up details originally designed for Board schools, public baths or wash-houses, and producing, with very little good effect, an ordinary type of vestry building.

The Chairman then put the vote of thanks, which was heartily agreed to.

Mr. Brydon, in reply, said that air was admitted to the Congressional Library, Washington, practically free from dust. He thought the Institute was specially indebted to those American architects who had so cordially and freely sent over those designs which were on view that night, and he thought that a hearty vote of thanks should be awarded to them.

Mr. Burgoyne having briefly replied,

It was agreed, on the motion of the Chairman, that a vote of thanks be passed to the American architects who had sent drawings for inspection.

It was also announced that a special general meeting will be held on March 6 for the election of the Royal Gold Medallist; to be followed by a business meeting for the election of candidates for membership. At the conclusion of the business meeting, a paper will be read by Mr. A. C. Dickie on "Early Christian Churches in Palestine."

The meeting then terminated.

THE ARCHITECTURAL ASSOCIATION:

COLOUR DECORATION.

AN ordinary fortnightly meeting of this Association was held on Friday last week in the Meeting-room of the Royal Institute of British Architects, Mr. G. H. Fellows Prynne, President, in the chair.

The minutes of last meeting having been read and confirmed, a vote of thanks was passed to Mr. H. L. Florence for allowing members to visit the Carlton Hotel, Haymarket,* recently.

Mr. E. Howley Sim, Hon. Secretary, announced the donation to the Library of Mr. Francis Bond's book, "English Cathedrals, Illustrated." A vote of thanks having been accorded to the publisher, Mr. George Newnes,

The Chairman announced that Mr. A. H. Hart's classes on "Colour Decoration" will commence on March 8. He (the Chairman) hoped that a large number of the members of the Association would join such an invaluable class. It was a great pity that the subject had been and was still so much neglected, and he hoped that, after the paper they were about to hear from Mr. Cole A. Adams, one of their past Presidents, many of them would enthusiastically join the class.

Mr. Cole A. Adams then read the following paper on "Colour Decoration":—

The subject of colour decoration is a vast one, and the time in which to consider it this evening very little, but even that little may seem long, according to how the lecturer treats his subject. And how to treat it? "That is the question." So much has been written and said about it during the last, say, five-and-twenty years, until I fear there is almost a likelihood of a deaf ear being turned to the preacher.

After careful consideration I came to the conclusion that I would head my remarks, "A Chat about Colour Decoration," and I will endeavour to say something which may haply be of some practical use to my fellow students, for whom I have every sympathy, and the happiest recollections of the years wherein some of us have studied colour decoration together. My discourse is addressed to students, and I shall attempt no dissertation upon the higher flights that have to be ascended in treating so voluminous a subject. I propose to speak of some of the various methods adopted in colour decoration, and to offer a few suggestions which may be of use in your study of the subject.

In our cities and manufacturing towns the architect, in attempting to add the charm of colour to his building, has to encounter the smoke demon, who, no sooner than the building is finished, sets to work to deface it as far as he is able. At present—and I fear so long as he is permitted to work his wicked will—no remedy is possible. Perhaps in the future, when we shall see more use made of electricity, or some means are found to compel manufacturers effectually to consume their own smoke, and householders also, then, when this demon is chained, we may see our buildings decorated with colour of a more cheerful tone than they now possess.

The trials which have been made of glazed earthenware or majolica for both outside and inside architectural treatment are hardly, I think, quite satisfactory. It is an excellent material where cleanliness is a sanitary necessity, but the glazed surface is fatal to that repose that colour when applied to a building seems to demand. It gives a restless appearance which is disturbing to the harmony of colour; and even this material our enemy, the smoke fiend, does not respect. But then you can wash it, say its advocates. So you doubtless can; but do you find in practice it is done? The light falling on the mouldings and ornaments is a disturbing element, and distorts them. It gives a better appearance and is more decorative if the material presents a smooth, non-reflecting surface, and has only a dull glaze. You do not varnish decoration which you apply in oil colour, for the reason that you would lose that quality of flatness and repose which are so important. Detached objects executed in a glazed earthenware are properly so treated; it is when it is applied in large surfaces it becomes distracting. These remarks apply, but in a lesser degree, to polished marble, which, unless introduced with great discrimination, is hardly satisfactory when covering large surfaces.

Mosaic should, I think, be always employed on a concave or convex surface, and is hardly ever pleasing on a flat surface, hence its unsuitability in reredoses, as generally applied.

And here I am tempted to ask how long the custodians of our cathedrals and churches and the worshippers in them, will be content with the sculpture and painting that is generally thought good enough? There are not wanting instances where one sees work which it is a pleasure to find, but such instances are rare. Buildings erected by our best architects contain too often sculpture and painting executed by incompetent and nameless artists. Sedding saw this need for calling on accomplished artists to help him in his work, and all true architects would wish it, instead of having to be content with the poor, lifeless, mechanical productions of advertising firms one generally sees. When we go abroad we are shown some masterpiece of the sculptor or painter's art done at a time when the highest efforts were alone thought worthy of a place in the sanctuary; and yet at the present time men are richer than they ever were, and could the better afford to give. The monuments to the dead in our cathedrals and churches are frequently works of worth and beauty, but we want equally good work dedicated to the service of the living God we worship.

Mention must in fairness be made of the great progress made in stained glass; much of it is admirable. Perhaps it will not be long before the educated and wealthy will call in the aid of artists who will give us work that shall be worthy of the building they are placed in, and worthy of the artists who executed them. There can be no better medium of perpetuating their fame.

In a house in the North where it has been my privilege to stay many times, built for the most part by a man who comes from an artistic race and who himself is artistic in every sense, is a mode of decoration which, as far as I know, is original, and certainly most delightful. The decoration I wish particularly to call your attention to in this house, I will endeavour to describe, and I am indebted to the owner for this description. He was present and saw how the work was done, and the artist who executed it was a Scotchman—by name Cottier—a man of great genius, better known in the North and America than here in London.

The walls and ceilings were prepared in the usual way. They were then covered with a thick coat of oil and whitelead, made the consistency of pudding, and laid upon the walls and ceilings with a trowel. The next process depended upon what the nature of the design was to be. Supposing it was the ceiling to be treated, as a vine trailing over the whole surface; the artist with his thumb boldly draws the leading lines of the design, and then with the end of an ordinary paint brush draws the stalk, leaves, and fruit. Those parts which he wishes to emphasise he modelled in the material—such as the grapes, which are raised in relief; in fact, with the coating which he has been careful not to lay on to a uniform thickness he is able to produce effects, whilst moist, as his fancy dictates. If he wants a more or less geometrical pattern on the walls, he takes a comb and by eye draws in patterns such as you may see done on the outside plaster of old cottages in Suffolk and elsewhere, and also similar to some Japanese patterns with which you are all familiar. Again, on the surface thus prepared, he puts a powdering here and there of small patterns. This coat, which is capable of taking any kind of design the artist may wish and his fancy dictate, is allowed to dry and harden. It is then painted the general colour it is to be, and the artist has various mixings at hand of the same colour and blends them as he goes. Those parts of the design to be gilded are so done and the various colours applied and allowed to dry. Finally the work is dull-varnished and has bronze powder mixed with the varnish, which gives a kind of sheen to the whole. The bright parts in gold are toned down and the colours blended one with the other. This, as far as I could gather, is the process. It is unlike anything with which I am acquainted, and it has great

* See our issue for February 11 for a brief description of the building.

possibilities. It gives somewhat the charm that a picture does in which the colour is laid on unsparingly with brush and palette knife. The burred edges of the patterns, flowers or fruit raised in the process reflect light. The colours running one into the other satisfy the eye by their variety, and the dull old gold effects, mingling again with the bronzes, give a richness and *tout ensemble* which is charming. This work, however, must be done by artists. Executed by the ordinary decorators it would be intolerable.

One striking effect in this house was suggested by the patron: he saw a ceiling after it had been floated with the oil and white lead with the trowel marks left. With a happy inspiration, he told the man to leave it so, and paint it with a deep copper bronze. The result is a most happy one—it has the same charm that beaten copper produces.

In speaking of this decoration—which I am afraid conveys but a feeble impression to your minds—I must tell you that the rooms are for the most part fine and lofty, the floors of parquet, and the house full of the most delightful old woodwork and furniture gathered from many cities at home and abroad; the walls are hung with pictures, and an air of distinction and good taste is prevalent everywhere, which makes a visit to the house an education in itself.

There may be some among you with an eye and love for colour and ornament who might do much worse than take up this branch of architecture as their calling. With the advantages you enjoy of learning your profession, it would be a great gain to you, and you would bring to bear a knowledge of architecture and building construction which would be of infinite use. The want of such acquaintance with this art accounts for the failure one so often sees in modern decoration. If we possessed artists with architectural knowledge, who made it their calling to decorate buildings, it would be a great public good and the public need educating in the matter of good taste. Growing up around us are town halls, picture galleries, free libraries, swimming baths, &c. Do not these offer scope for the artist? There are hundreds of such buildings lately come into existence waiting the hand of the artist. For a moderate sum, depending largely, of course, upon the building and the class of decoration, they might be made more attractive and interesting. Now, what happens? The powers that be call in the local painter and decorator; he sets to work and—paints it. Knowing very little of the principles of decoration, absolutely nothing about architecture, he, of course, cannot apply his decoration architecturally, and as a result, he not only wrongs the building and the architect who designed it, but commits the further crime of offending against good taste. Now, for comparatively a few guineas paid to an architect, who made such work his speciality, or to a skilled decorative artist, the same local painter and decorator might be led to turn out a work which would at once appeal to educated taste and give the public decoration of which they might be proud. I believe if authorities having the care of such buildings knew where they could obtain competent advice and skill in carrying out this class of work, they would avail themselves of it.

There is abroad everywhere a quickening of interest in public life; and the cities and towns are vying with one another in providing buildings dedicated to the use of the public which augurs well; and, as time goes on, we may look for a further extension of this good—as good it is—tending to break down class prejudices and bring peer and peasant together with the happiest results; in good time much may be done to render the lives and homes of the poor happier and better by this process of levelling up. To this end the decorative artist may employ his talent and do good by creating beautiful work that must have a refining influence for good. Few towns there are of any importance that do not tempt our great singers and actors to visit them, few that do not possess some work of an architect of eminence—and it may be that at no distant future—few will be said not to possess some work of art of a great painter or sculptor in a richly-decorated building. Is it not worth working for to become one of them who shall add to the fame of the town who employs him, by his skill in colour decoration, instead of leaving such work to be ignorantly and vulgarly carried out?

Experience in practical decoration may be gained in a way that is probably within the reach of most of you. In the parish in which you reside there will be a school or a parish room, and the parson would doubtless be glad of any one who could be found to volunteer to decorate it. This would give you the opportunity of doing experimental work which would be excellent training, and, at the same time, you will be doing practical good to others. But how to set about it! Parson may not unreasonably object to having his building made use of for experiments. You must first qualify yourselves by learning the handicraft to convince him you know something about the art.

I think one of the best ways to study decoration is to sit down before the object you are engaged upon and try and grasp the notion or leading idea of the artist; how he has treated it and how worked it out; what leading colour or colours he has chosen; in short, its leading characteristics. This sitting down before the object you wish to study, and, so to speak, inhaling it through the pores will not be lost time. It will, moreover, have the great advantage of training you to the habit of recollecting a scheme of design and colour, so that when you come to transmit your thoughts to paper, you will have helped to train the faculty of seeing your design in your mind's eye. To resume: Having taken in the scheme or design, I think the next best thing is—supposing it to be a ceiling, for instance—to make a plan and sections of it; then select that portion which will illustrate how the design or pattern will repeat. These drawings you should sketch as neatly and with as little detail as will express the thing you are at work upon, then put on a few leading dimensions; note the distance from the eye where the decoration is most effective, the distance from the eye, the style, probable or approximate date, place, and, in fact, each and everything that occurs to you as worth noting. I have found by experience the utmost use of thus jotting down particulars of what I am sketching, and I am sure it is a good plan, as (may be years after), it recalls the subject and gives you data which may have passed from the memory. Having made these drawings, which may be more or less elaborated according to what you are engaged upon, you may now proceed to detail the work to a larger scale and draw with the greatest care the ornament. A number or letter referring to where the part is should be noted on the plan or section, so that the details may agree with the drawings. When you have got your details sufficiently forward in pencil you may then proceed to colour them, and this will test your eye for colour. If you have not got your colours with you, or are pressed for time, a simple plan is to put on the drawing a schedule of colours and number them thus, red 1, blue 2, yellow 3, and so on; or you may elect to adopt the heraldic method. Either of these ways will be of use in keeping you in mind of the scheme of colour, and then you can at your leisure colour in your drawing; but the study will be of most use which is painted on the spot. And here I would remark that the habit of noting will be of use in describing how particular effects are produced and where the colouring has been influenced by the hand of time. Some decoration which we find now so charming owes that charm to reasons never dreamt of by the artists who did the work. In fact the work of the past owes a great deal to the hand and palette of good old Father Time.

Of course, in sketching at a museum, for instance, the object is generally detached, and can be embraced in one drawing, but here again I would urge upon you the need of cultivating your power of criticism and observation by noting down any memoranda which the subject may call forth. Let nothing appear too trivial. Attention to seeming trifles trains the mind to greater things, for is not the house built of separate bricks?

It all depends upon what you are sketching, but where the detail would work out very small and not large enough to explain the design, that part should be drawn to a larger scale. As you proceed you will insensibly learn what best shows and illustrates the subject which you are engaged upon.

As excellent examples of studies, I would instance the exhibition of students' drawings for the Owen Jones' Prize, which was on view here recently.

In studying from nature I would suggest to you that the same method should be adopted. And as correctness, beauty, and accuracy of line cannot be learnt better than by study from the living model, the same principle exists in studies made from still life, and no better advice can be given to those studying decoration than to go direct to that source. Every subtlety of line, curve, and contour, every gradation of colour and tint, of light and shade, will be found by those who seek it, in endless variety, and great is the happiness of the search. Store your sketch book with such studies. Take, for instance, a spray of any flowering plant and sketch it in outline with the stalk, leaves, and flowers, with just enough detail to express it. Note the varieties of form and curve, and how the effect is produced. Then sketch the same spray from another point of view, and if you wish to study it further, from yet another. Then detach one of the flowers and carefully draw it in all its parts, if possible to a full size, the plan, elevation, and section. What is the use of all this? is asked. I reply, every use; for the knowledge of parts thus grasped will one day stand you in good stead, and it teaches you the value of patient research, and trains you in the habit of thinking no part of your work too small or insignificant, besides giving you glimpses of the miraculous, and discovering new beauties which you never so much as dreamt of. You must, therefore, train yourself in the habit of close observation, which will in time become a habit. The simplest flowers are the most suitable to study from, and the most useful, the simpler the better. For models of expression in sketching you should study the Japanese. They succeed in that most difficult art of knowing how much to put into the picture to express its meaning. Time spent in studying these drawings will not be lost. Excellent Japanese books can be procured at Mr. Batsford's, bookseller, Holborn, and very inexpensively. In colouring your studies from nature do not attempt more than giving the local colours, and only showing enough to express this. The way the Japanese lay on their colour will best illustrate what I mean; there is no need to spend time in elaborating your studies you do not want to paint pretty picture cards. For the mingling and blending of colour you cannot do better than get hold of a piece of polished agate, marble, alabaster, or other richly-veined stone; note their qualities of line and colour; these studies will require great attention in the execution and, *en passant*, the employment of body colour will be found useful in making them. Then make sketches of birds, beasts, shells, and fishes which present features of decoration, and draw the same object from different points over and over again, till you have driven it into your brain and learnt something of what they have to teach. Note carefully the lines of decoration and colour and the value of contrast. This is what Tennyson writes:—

> See what a lovely shell,
> Small and pure as a pearl,
> Lying close to my foot,
> Frail, but a work divine,
> Made so fairily well
> With delicate spire and whorl,
> How exquisitely minute,
> A miracle of design!

Butterflies, beetles, and gorgeous insects convey a great deal of teaching, and train the eye to the beautiful harmonies and daring contrasts to be found everywhere in nature, which brings colours together in contrasts of ever-varying beauty. Any dogmatism upon the harmony of colours, and what colours may or may not be used together, is silenced when one sees how nature employs her pallette. In making these studies from nature, do not forget the need of written memoranda, descriptive of what you have before you, and figure the dimensions upon the drawing; in short, give as much information as you can find space for. Bear in mind they are *studies*. You do not need to make pretty drawings to show "your sisters, and your cousins and your aunts." Let your studies from nature and from the works of man run side by side.

You will find it useful to acquire the art of sketching in perspective. You can in less space show so much more of your subject, and if you can readily and easily sketch in perspective, it conveys the intention much better to the lay mind. It has, besides, a *commercial* value, as you may convince a client the more readily if you can show him how a work will look when executed. At the same time, do not let this kind of sketching take too great a hold upon you to the neglect of careful and figured details drawn either by eye or to scale. Drawing in perspective becomes so

fascinating that the temptation is to make a picture, and you will learn your lesson better by a hard matter of fact diagram. In making studies of ornament in monochrome, it is most useful training to do so with a brush. You cannot get anything like the freedom or effect by using pencil or pen, and you will come nearer to the Greek and the Japanese if you copy their painting direct with a brush. With a little practice you will find no great difficulty; besides, it is excellent training, and it will let you into the secret of how they produced their effects and why their ornament takes certain forms. If you wish to study the ornament as practised by the ancient Greeks, go to the British Museum, make your way to the vase-rooms, and you will see how, by the employment of simple yet lovely forms, they have produced designs in endless variety and mostly with the use of a single pigment. We frequently hear a great deal about the accuracy displayed by the Greeks in their treatment of ornament. Many of the examples which have come down to us are anything but well drawn, and all that I have studied show an absence of mechanical accuracy, being obviously executed by the eye and hand only.

It is the fashion in employing Greek ornament in decoration of all kinds to do so with geometrical precision, with the result that it is all "Faultily faultless, icily regular, splendidly null." It does not pulsate with life, and to employ Greek ornament thus is to miss half its beauty—which does not consist in perfect accuracy of parts, but in that charm which the trained eye and hand alone can give to all work, and which is lost in mechanical execution.

In the repetition of ornament, where the same pattern is employed over and over again, stencil plates are generally used, and a few remarks upon stencil plates and their use will not be out of place. The great objection to them, is where the pattern to be repeated cannot be cut without leaving "ties," which are used to hold the stencil together, and these "ties" it is seldom possible to touch in afterwards without their being apparent. The whole art of stencil-plate cutting has a rather narrow margin of limitation, and work carried out with the extensive use of stencilling is anything but pleasing. It has a thin, starved, stiff, mechanical appearance. I think we may borrow a hint from the Japanese method of employing stencil-plates as practised by them at the present day.

In a work on the art of the Japanese stencil cutter, by Andrew Tuer, F.S.A., he says:—"The artist-workman takes some half-dozen sheets of tough paper made of mulberry fibre (Broussonetia papyrifera), prepared with the juice of persimmon and waterproofed with a hard-drying oil. On the top he places the artist's design drawn with ink. The sheets firmly secured, he begins cutting with a long thin knife, which he pushes before him in the same way as a copperplate engraver at home uses the burin. Slowly and accurately the keen blade cuts through the little pile of paper following the curves of the design. Where there are punctured holes or dots the knife is superseded by a fine punch, for if pins were used a bur would be formed and the design would not print clean and sharp. When the cutting out is finished, two of the sheets are damped, so that they may expand and—what is of equal importance—contract equally in drying. One is laid down flat and covered with adhesive material. The threads are then one by one put in position, the ends sticking on to the margins. The second stencil is accurately laid over the first by means of upright pins placed in the 'register' holes already mentioned, the two paper plates are brought exactly together and the threads securely imprisoned. The joining of the two plates inclosing the threads is so absolutely perfect that a strong glass fails to disclose any signs of overlapping or unevenness. That any one but a Japanese could execute such difficult work as this is simply impossible.

When the stencil cutter has got through his first pile, he puts a stencilled impression on the top of the next as a guide in lieu of the original drawing which now has no independent existence, and he will continue cutting out the same design until he has a number sufficient for his purpose. From its nature, especially when the design is delicate and finely cut, a paper stencil-plate cannot last very long. Many of the examples in our collection have seen so much service that they cannot again be used."

Now the Japanese employ stencil-plates for the decoration of their textile fabrics, and produce most artistic effects; whether they have any like method in use for wall or ceiling decoration I do not know, but I venture to throw out a suggestion for adapting the principle employed by them, and applying it in a modified sense to our use.

Let the design to be employed in repetition be drawn on fairly stout cartridge paper, and it may be designed without any care for the "ties" which it should be the object to dispense with, so that the plate shall leave the stencil brush finished. Then give the paper a coating each side of patent knotting, and with three or more similarly prepared blank sheets secured together at all available points, place on a sheet of plate-glass, cut out the parts through the several sheets with a sharp knife. Then when you have cut out the pattern, liberate the sheets and insert between two of them a network of very fine wire, which may be made taut by attaching it to a frame (a trifle larger than the paper stencil plate) of stout wire. The two plates, being exactly adjusted, should then be pasted together, and when dry given another coat of knotting. It may be objected that the wire which takes the place of the "ties" will be objectionable and will show in the colour, but with skill in manipulation it may be made, if you will, to become part of the design. I do not think it will be any detriment, and at all events the plan will admit of a much wider, artistic, and more extensive use of stencilling. By having on your palette several mixings of the colour of varying tints, and two or more stencil brushes in use, it is very easy to blend the colours of the stencilling in executing it, and to remove the harsh mechanical appearance one so often sees. By a series of plates effects can be produced, on the same principle as wall papers or printing in colours is done, and much of the objection to stencilling will vanish by adopting this method of the Japanese.

The difficulties that beset a decorative artist are very great, and he must be ever studying so as to store his brain and keep abreast of the times. I think a student can hardly do better than commence his studies of decoration of the different styles with copying from the decoration of savage tribes, of which the British Museum and most museums contain a goodly collection. I advise this as affording illustrations of what the untutored man does in ornament and colour and there is a marked likeness in the early efforts of different nations or tribes; lines, circles, dots, zig-zags, herring-bone, and the employment of the primaries of colour.

Then the styles should be taken, commencing with the Egyptian as the earliest. Let me suggest a visit to the Crystal Palace at Sydenham, where an object lesson may be learnt from the courts decorated in the different styles. Unfortunately in this country we have but few examples of ancient decorated buildings to study from and have to be content with the fragments in our museums and the various objects to be found there. Still one must take things as they are and be content; but however beautiful the various fragments are, they have not the teaching that applied decoration to a building possesses; to obtain this you will have to go abroad and study the style you wish to become acquainted with in its own home, with all the surroundings which so influence the art. Much and most useful information is to be gathered from the splendid works which have been published, and which you may see at the museums and in the library of the Institute and Architectural Association. They are magnificently illustrated, but the colours can only faintly show the effect that the building produces under the ever-varying light and shade. As it is hardly possible to study all the styles in the land where they have had their birth, you must study from those specimens which we possess and from books.

One of the uses of possessing a knowledge of the styles is, that you never know when you may be called upon to make use of this knowledge, and you should look upon it as part of your education, and that there is no better way of familiarising yourself with them than by such study. Your sketch-book studies should include all the information you can acquire from books, and let that information be culled from the best writers on the subject; but bear in mind, a closer and more thorough study will have to be made of those styles in which you are thinking of working.

What is the best style to adopt for *fin de siècle* decoration? asks the bewildered student. The hum from the battle of the styles fought in the sixties is now at rest, and we are content to admit in the nineties whatever is the fancy of the day, until maybe, at no long future, an Architectural Association student will be found, sketch-book in hand, lost in admiration of the severe simplicity of Gower-street architecture.

Yes, all is changed, and we are agreed that there is now no style in architecture which is worth dying for. For some years past men's faith in thirteenth century work as the *ne plus ultra* has been rudely shaken, and the influence of a younger school of clever architects, led by Sedding, changed our faith, or, say, admitted into it greater latitude, and in the Church of the Holy Redeemer, Clerkenwell, and Holy Trinity Church, Sloane-street, we feel this force of Sedding's power and recognise what his teaching was; that we were free to adapt from the various styles what seemed most fitting and to cast aside the bonds of formalism, which required chapter and verse for every feature introduced into a building. He declared trumpet-tongued that he, for one, would not be "cribbed, cabined, and confined" by canons which the older men had laid down, and maintained that salvation was also to be had in the "flat and pointed" with a little Classic, of a kind that would have made the men of the schools smile and wonder. Yet under Sedding's inspiration we feel, and more especially those who knew and loved him, the influence of his magic; and even though we refuse to go all the way with him, we cannot but recognise the power and that *something* which it is difficult to define, but which we call *genius*.

What Sedding's status will be in the hierarchy of art, we must leave to the future; with the restraint that his genius imposed, what we feel, perhaps, inclined to condemn, we are compelled to condone. It is in his followers that we have to look for results, and we have not had to wait long for them; the illustrations published in the professional journals are many of them strange and eccentric. They exhibit a likeness to the work of the master, but the spirit is wanting in them. But though these efforts may fail, are they not the outcome of the cry for freedom from the shackles of formalism? If men, in the joy of this freedom, may here and there stray into the paths of licentiousness, let us not be too severe in our condemnation.

As Architecture is the mother of arts, so she must influence for good or evil her daughter Decoration. No longer will men tolerate a cold, lifeless revival of the past, a grinning skeleton galvanised into life. Sedding's gospel of freedom is heard and felt, and what he taught finds many disciples.

In every known style under the sun there is truth and beauty, and a likeness which makes them all akin, and as the bee sucks the honey from every flower, so may we gather the sweets where we will. Who shall say that we are not to make use of ornament, no matter where we find it, if we have the wit: not a mere copying, but ideas worked out from it, "whatsoever was written aforetime was written for our learning," may we not employ the words without irreverence? Evolution is at work now as it ever was and ever will be.

And what a perplexing state of things exists in our midst, and what difficulties it creates. The artist-decorator may, in the course of his practice, be called upon to decorate a church built in the Classic style, the Renaissance, the Romanesque, the Byzantine, the Mahommedan, or the Gothic; he will be required to do so in the correct style, as it is called, of the period of which the particular church is an example. Another time it will be a theatre, a concert or ball room, or mansion where maybe particular rooms are to be decorated in particular styles; such a house I came across some time since in the north decorated by that clever artist, whom I have before mentioned, the late Mr. Cottier, but, with his skill and inspiration, one was forced to be pleased. Is it not, however, appalling this demand upon the artist? No wonder if he bewails the age in which he has been born, and, from sheer weariness, closes his eyes and dreams of a time in which one style was in vogue, and one only; no newspaper critics, no art journals, no books on art, no cant and jargon of the stereotyped order—the one style, which yet gave infinite latitude to the ordered mind and the inventive genius. Small wonder that, with time to work out his idea, the Greek artist excelled in beauty of design which never lacked grace, and that quality of fitness and repose are also to

be found in the best Japanese art, which, alas! in its turn threatens now to become a thing of the past.

But our dreamer awakes to the fact that he can only in dream world live in Greece or Italy in their period of greatness, and that he is obliged to pass his days at the end of the nineteenth century in a murky atmosphere, with all its hurrying and skurrying; to enter the lists with his fellows and compete for the prizes; and the prizes are to the skilled and the strong. Surely it is wiser not to be troubled over much about what style to adopt, *i.e.*, any of the various styles of decoration; more important surely to cultivate a good style—to study the old styles and try to absorb the principles to be found in them. Then if you elect to follow any one style in particular, to do so in the spirit in which it is conceived, and not to attempt the impossible or to revivify the past; here is unlimited scope. Take English as it is spoken at the present day—a language rich in its antiquity; and yet how many words and phrases are borrowed from other nations! And in America how much more is this the case; and Americans, less trammelled than we, are producing work the best of which is distinctly modern and original in character.

One of the problems in colour decoration is to employ only those colours which will look well both by daylight and artificial light. These will be influenced again by the amount of daylight which is obtainable in the place which is to be decorated. Here only experience will guide you correctly, and here I may say how very difficult it is to prepare any sketch or drawing to show what you propose. Some artists positively refuse to do so, and no wonder. Still there are clients who insist on having an idea of what the design is to be, and who will see a sketch first, and to a young artist just starting on his career, not to show what he is going to do may be fatal to his employment. Therefore, if it is insisted on, show as little colouring as possible, enough to give the general scheme, and guard yourself by saying that circumstances may compel you to alter as you go along. When the client has approved of a scheme, the best thing that can happen for both client and artist is, that the former shall go abroad for a short time and not see the work through all its stages until finished; for should the client not absent himself, but look in to see how the work is going on, he will in all probability destroy his own peace of mind and that of the artist.

Now interiors have to be used by daylight or by artificial light, and by both day and artificial light. By daylight, as picture galleries, banks, Courts of Justice. By artificial light, as theatres, ball-rooms, and other places of amusement, and by both day and artificial light, as churches, assembly and concert rooms, &c., and private houses.

Under these conditions of lighting come others, and in the way in which they are met will depend largely whether the decoration is successful or otherwise. A quiet half-hour in the place you are called upon to show your skill, with sketch-book in hand, will be time well spent.

If the place is used by daylight, note what amount you have at your disposal, or will have when the windows are upholstered; what is the aspect, north, south, east, or west. Then for what use the apartment is to be put, and whether it is wanted for summer or winter use. Then, again, at what time of the year you see it, so as to judge of the amount of light; if a sombre and subdued effect is sought for, or a bright and cheery one. If, again, the apartment is to be used at night, obviously your colours must be tried by artificial light, and make your experiments by that kind of light which is to be adopted. If for day and night use you must use those colours which look well by day and night. The design thought out, you must first try the colours you are proposing to use upon the walls or ceiling, noting whether they are what you intended, and how one colour goes with another, always judging of this at the distance it will be when executed, and settling this upon the spot. This trial of colours upon the spot is of the first importance, as many are the changes that take place, and what looks well in one place looks bad in another. The experiments may be in colour only, without any design upon them, or you may, better still, put up full-size coloured cartoons *in situ*, and judge of the effect. It is a good plan to leave them up for a day or so, frequently it happens that after an interval you come upon the design with a fresh mind, and can form a better judgment than at first, and decide in what points you think they need amendment, and whether, as is very probably the case, you may omit some of the detail, strengthen and accentuate those parts which require it, and send back or bring forward others. Do not hurry over this stage of your work; it may take you hours only trying the colours and effects. Decoration needs the exercise of all the virtues, and patience in particular, and you cannot properly decide questions of colour with watch in hand nearing the hour at which your train starts. Let him who thinks of embarking on the pursuit of decoration think on these things. When you get the colours and the design settled somewhat to your liking, you may consider yourself happy; vigilance will still be required, but the worst is over. If you have a good, intelligent, and honest foreman of painters, another great weight is taken off your shoulders; and by all means in your power interest those who are carrying out the work for you, and do not spurn their advice.

It may be that you have to collaborate with some figure or landscape artist, and then your whole scheme of colour has to be subservient to his work. In fact no two cases will be alike, and it will call forth all your powers of intelligence to meet and overcome the many difficulties that may arise.

And the payment for all these years of study spent upon decorative work? Your payment must be in the first place the delight of doing colour and design, for it is seldom you are paid adequately for the labour and time it involves. You will sometimes find clients who are under the impression that the five per cent. will cover your expenditure of brains and time, and be genuinely surprised when you tell them that such payment is *totally* inadequate. A gentleman connected with a large firm of decorators once told me that they reckoned 20 per cent. in their estimates for the "brains" and for good work requiring special skill and much time, this is not excessive. Where a price is given for the work complete, a man knows what he is spending—stock, lock, and barrel—and pays the bill cheerfully. But if *plus* the actual cost of the decoration, a client has to pay the architect for his brains, skill, and time on the designing, he frequently feels aggrieved. Unreasonable, is it not? But a fact.

Perhaps the best advice, from a purely commercial view, is to get what you honestly can, acquire a name and fame by judicious self-advertisement, strive to cultivate a manner, to become the fashion, by letting it be known far and wide by the blast of the sound of your own trumpet, that *you* are the artist to employ, and then Society will pay you anything in reason—and out of reason—you like to ask.

I fear that what I have said will appear to be as "bald unjointed chat," but if I have succeeded in dropping some seed which, falling upon fruitful soil, may grow, it will not be in vain that I have set down some thoughts that occurred to me, though I could have wished they were in a better setting, more worthy of your acceptance and of those who did me the great honour of asking me to give a paper on colour decoration.

The Chairman, in opening the discussion, said they were all grateful to Mr. Cole Adams for giving them another lecture on colour decoration. Many of them had passed through the lecturer's classes on colour in past years, and those who had done so were able to speak as to the value of them. The low relief decoration in the house in the north must be very beautiful, judging from the lecturer's description, but it was not altogether new. He (the Chairman) knew that the treatment had been adopted by others in several cases; but the way in which the colour decoration was, according to Mr. Cole Adams, applied was certainly novel. As to the lecturer's remarks about mosaic, surely it was a little too sweeping to say that mosaic was never satisfactory on a flat surface. It certainly was in many cases far better on a concave or convex surface, but when properly used a very good effect could often be got on a flat surface; some of the work at St. Paul's Cathedral indicated that the flat treatment of mosaic was not altogether a failure—in fact, much of the flat mosaic decoration there was very beautiful; but then, much of it was entirely out of sympathy with the architecture. They could not deny the value of stencil. In repeat work, especially, which could only otherwise be done slowly and laboriously, it could be used with great advantage; but it was quite easy for a real artist to put a good deal of feeling into it by mixing his colours so as not to get one dead tone of colour. The advice Mr. Cole Adams had given as to studying examples of executed work and trying to grasp the feeling of the artist who did it, was most valuable, as was also his advice as to Japanese or Oriental work—work which was too much neglected by us. The Orientals and Japanese used primaries and secondaries without fear, and got wonderful harmony without apparent effort; it seemed to come naturally to them. They would have been glad had the lecturer given them his ideas as to the kind of colours he liked to use in domestic or church work in England. It was useful to have brought before them occasionally the experience of different men as to the use of colour and as to processes in this dark, damp, dingy climate of ours. We could not but be struck with the fact that in bright, sunlit countries the brightest colours were used. In Venice, for instance, primaries and secondaries were used quite freely, but in duller countries the contrast with such colours was so great that a certain amount of toning-down was necessary. In mediæval times in this country absolute primaries were undoubtedly often used in screen and roof work, &c., vermilion being used in harmony with other colours. Time had aided such work, and had helped in toning it down, and students, in studying colour decoration, should not forget that the colour we see in mediæval work was originally much brighter in hue. Moreover, in actual work, especially in church work, much brighter colour must be used than in studio work. In our damp climate it was necessary to study and thoroughly learn the best way to treat walls. He thought that a wax preparation, the colour being amalgamated with it, would be found satisfactory, for it kept back the damp. Students, in setting to work in decoration, must bear in mind the desirability of having a large scale scheme before them—at least 1 in. to 1 foot—so as to get the contrasts and harmony in their general scheme of colour. As to sympathy between artist and architect, the artist ignored the architect, and perhaps the architect did not sympathise with the artist as he should. But artists did not appear to think it was part of their education that they should understand the lines of architecture in a building. They treated architectural details as so much canvas—simply as wall-space for their decoration, which was applied wholly independently of the lines of architecture. This was fatal to both the architecture and the decoration. The more artists and architects talked such matters over and agreed as to treatment, the more successful would architectural decoration become. There must be more sympathy with the artist as to unbroken surfaces, but artists must get more into sympathy with architecture, and must follow the leading architectural lines, otherwise there could be no really successful fresco painting or mosaic decoration in buildings.

Mr. L. A. Shuffrey, in proposing a vote of thanks, said that students in studying decorative examples should not be content with copying. The sketches that one sometimes saw were very beautiful in their colouring and very life-like, but colour must be carried farther than that. Copying did not bring into play the imagination, and it was very important that imagination should be combined with the practice of colour, either on walls or in work on a clean piece of paper. It was important that a student who wanted to get a good grip of colour should do something in actual work. The suggestion that Mr. Adams made, that architectural students who had a taste for colour and form should take up that branch of artistic work was an excelleut one; there was plenty of room for artists in that direction. At the start, there was the difficulty of remuneration, and unfortunately nowadays very few people would embark on any work without knowing beforehand what the cost would be; that hampered decoration—as it did everything else—very much indeed. It was an unfortunate fact that that tendency had led to the introduction of the "firm" who were willing to make estimates for a work and take risks. A client then, in going to a firm, saw the head of a department, who did not understand decoration, for instance, in the least, but the client did not seem to mind so long as the work was executed within the estimate. Another difficulty was that clients had ideas of their own sometimes, and that was most difficult to

contend against. It would be a very good thing for a young architect who wanted to get some experience in the use of colour to tackle his own office! It was astonishing what a number of years an architect could go on without getting acquainted with the actual practice of ordinary painting. Two or three weeks actually doing such work would give a man a better acquaintance than could ever be gained in superintending the erection of buildings. As to glazed tile work, he did not like it in any form whatever, though it was being used now in internal surface work, with a semi-glaze, with some success; but he could not agree with what Mr. Adams had said as to marble. Marble could be polished, and the more it was polished the more beauty one got out of it: polishing gave a beautiful transparency and depth, and he was pleased that marble was being used more now than formerly. It was a difficult thing to use together satisfactorily two marbles of different colour, and it was a good method to get a strong dividing line between them. The opportunities of studying executed work were limited, but they were available, and the benefits to be gained in connexion with the Architectural Association visits were considerable, especially when the buildings visited were in an almost finished state.

Mr. J. D. Crace, in seconding the vote of thanks, said he was glad the hear the Chairman remark that those who undertook decoration should begin by endeavouring to pay respect to the architectural intention in a building. That was the first and principal rule which every decorator should be guided by; and all studies of schemes of colour, &c., were comparatively insignificant if respect were not paid to a building which had any title to respect. He agreed with the Chairman, that the artist should endeavour to put himself more in sympathy with the architecture of the building he was decorating. Every building of any importance had received from its architect a great amount of study as to the effect to be produced, and if the architect were a man of ability he would in most cases devote a great deal of consideration to the effects to be got by light and shade, and the accentuation of form. Great injury, therefore, was often done to a building by the failure of the artist to get into sympathy with the architectural intention of a building. He believed that nothing could more help a young architect to realise what decoration is, and what was expected of him in decoration, than to inspect a building before it was decorated and try and realise where and how colour should be employed. Harmony could only be acquired by actual study and practice—constant practice from nature. He would like to emphasise the great importance of trying to realise what system of colour would best bring out features which were intended to be the expression of form in the building itself. As to the fact that a greater amount of brilliancy of colour was tolerable in strong sunlight compared with what could be used in the kind of broken light got in this country, as a rule, it was largely to be explained by the mechanical action of the retina of the eye. Directly the eye looked at a bright light, it protected itself as by the stop of a photographic lens, by reducing the size of the opening. The opening being reduced, the radiating effect of bright colour was reduced correspondingly, and the eye was then less sensitive to a brilliant light. As to fresco work, and finding a material which would resist our atmosphere, in large cities one had to deal with the fact that the atmosphere was full of a free acid, which even ate into stone. Was it surprising, therefore, that fresco was affected also? In the country this was not so. He agreed with Mr. Adams that, as a general principle, a concave or convex surface was better for mosaic decoration than a flat one. Mr. Adams was rather hard, however, on the trade decorator, and he must not forget that Mr. Cottier, whose work he so much admired, was a trade decorator, and a very successful one. He (the speaker) was sorry that so much attention was drawn to "fancy" methods of decoration, for they were rather apt to lead a beginner astray, and to go astray in a material composed of white lead and oil was no joke; nothing short of pulling down the whole plaster could remedy an error, for the material set as hard as iron. The hand of time was very kind to all colouring, but it must not be assumed that the old artists left everything to time. He certainly thought that the study of birds and flowers was extremely valuable in acquiring a knowledge of how colours might be brought together, and what little niceties of tone constituted the means of bringing them together. Students were well advised to constantly refer to nature, but he could not quite agree that studies should be made in local tints. He thought that the harmony between flower and foliage largely depended upon shadows in the foliage. A green leaf and a pink or red flower were not strikingly harmonious when laid out flat together, but the introduction of shadows so toned the green that the flower was thrown into beautiful harmony and relief. When they were studying flower forms they should study them without shadow, but when for colour they should study them with all shadows. Mr. Adams' advice to students to go abroad to study examples was very valuable, for the number of examples of beautiful colouring in this country was very limited. The next best thing to going abroad was to study some of the beautiful things in South Kensington Museum, where models of some of the finest works of the Italian decorators were to be seen. He might mention that the Painters' Company gave a travelling studentship of the value of 50*l.* for foreign travel (of not less than six weeks) for the study of colour decoration. He felt that students of colour could not do better than compete for that studentship, for even six weeks of travel and study of good examples could not fail to make a difference in a man's career.

Mr. H. W. Pratt said that as one of those who helped to start the Colour Class of the Association twenty-five years ago, when there was a good deal of enthusiasm for colour, he was greatly disappointed that the subject had not been taken up in the present day with similar enthusiasm by students. If it had not been for men like Mr. Adams and Mr. Crace—who gave up so much of his time to the work of the class—the Colour Class of the Association would have died years ago. He (the speaker) hoped that the course of study in colour in the new curriculum of the Association would be successful, and that it would be attended by more than the comparatively few students who now supported it. Materials used in the construction of buildings play a great part in regard to colour, and the increased use of coloured materials in them the last twenty years had done a great deal to improve our architecture, especially domestic architecture. As to the relation between architects and artists, the architect certainly ought to be in the position of master in any scheme of colour or decoration in his own building. But the truth was that he rarely had an opportunity of acting in that capacity, for it was generally some long time after a building had left the architect's hands that anything was done in regard to a scheme of decoration. When such work was undertaken the trade or the art decorator was called in, and the architect had nothing whatever to do with the work and no chance of combining with the decorator in the treatment of the building, and so emphasising those features of the building that required it. When the architect had the chance it was to his and the decorator's advantage to work together. But that was not possible in the case of important buildings which were to be decorated, the architects of which had departed; and in such cases he thought that some architect should be called in to act in conjunction with the artist who might be decorating the building. In the case of the decoration of St. Paul's Cathedral, for instance, it seemed an unfortunate thing that Sir Christopher Wren was not alive to see the havoc that was being made with his magnificent building. It was time to stand up in protest against a method of decoration which one might safely say was never intended by the architect, and as to which one dreaded what next was going to be done to still further ruin the architectural features and character of much of the interior of St. Paul's. Unfortunately, one was not able to judge very well what was being done, because much of the work was covered up and it could only be seen piecemeal; but it was a case, as far as he understood, of an artist being at liberty to do what he liked with a great building, without any direction, advice, or control as to its treatment. It was a case of a good man being called in, but with nobody to look after him,

Mr. Crace said that he felt very much in agreement with Mr. Pratt as to the decoration of St. Paul's. Some time ago he went on the scaffold with Sir William Richmond, when he observed that the volute scroll which formed the base of the architrave of the clearstory windows was gilt and cut up into little squares in imitation of mosaic. He called Sir W. Richmond's attention to it, and that gentleman replied: "Yes, I want to suppress those hideous things as much as possible!" The future would determine whether Wren or Sir W. Richmond was the greater man, but Wren was great enough to justify respect being paid to those features of his architecture which are of importance and a serious part of his design. No artist was justified, however great, in altering features which were a definite part of a great man's building.

Mr. E. Howley Sim said he had once belonged to Mr. Adams' colour class and he had found the study of colour of the greatest possible interest. But there was one drawback to the study of colour, it was un-English: there was no style of colour decoration in England. In mediæval times colour decoration consisted principally of the use of primaries, for picking out mouldings and in diaper work, and the only use of colour in external English architecture was in green shutters. During the last forty years colour decoration had very much revived, but there was very little previous to that; whereas continental countries had a colour history of their own. We live in a grey country, and grey was the general colour of our buildings. As to inside decoration, that was generally confined to wall paper in this country and in domestic rooms. It was quite possible to use very brilliant colours and yet obtain a decidedly quiet effect.

Mr. Matt. Garbutt said he could not agree with Mr. Sim that there had been no art of colour decoration in England. A great many examples occurred to show that there had been a lot of good colour decoration in past times in this country. Many old churches were painted right through, and in Somersetshire he had seen a great many remains of colour decoration. It was true that there had been a long interval since colour was generally used in our public buildings, but we were now taking to it more. The question of expense accounted for much of the neglect of colour in our buildings. One reason why more colour decoration was not used in our private buildings was because ordinary rooms were so full of furniture. In dwellings in most eastern countries there were no lofty pieces of furniture covering up the walls as in England. Our architectural decoration had to consist principally of backgrounds, and the architect never or rarely knew what the furniture would be or how it would be disposed. The gentleman who did the colour decoration of the room in which they were assembled had treated it in a very modest manner, and as that was the home of architecture in this country he (the speaker) supposed they had the best scheme obtainable.

The Chairman said he thought they must all agree with Mr. Shuffrey's remarks about firms, but as to what Mr. Pratt said, it was not a question of "the master-architect." What was wanted was the artist to be in sympathy with the architect, and the two working hand-in-hand together. Architects themselves were a good deal to blame in the matter. They had to a large extent ignored the subject of colour decoration, and, as a consequence, their opinion was ignored by artists who generally refused to regard the architect as a leader in the matter because the architect too often did not know much about it.

The vote of thanks having been put to the meeting and heartily agreed to, and Mr. Adams having briefly replied, the Chairman announced that the next meeting would be held on March 3, when Mr. A. Saxon Snell will read a paper on "Public Baths."

The meeting then terminated.

THE ARCHITECTURAL ASSOCIATION SPRING VISITS:

NEW ROMAN CATHOLIC CATHEDRAL.

ON Saturday last week about seventy members attended at the new Roman Catholic Cathedral now in course of erection in Ashley Gardens, Victoria-street, Westminster, by the kind permission of Mr. J. F. Bentley, the architect, who was, however, unfortunately unable to be present as he had intended. The party was conducted over the building by Mr. J. A. Marshall, Mr. Bentley's assistant. The building at present has reached nearly to the level of the springing of the domes which are to roof it in. The plan consists of a nave

divided into three great bays, each about 60 ft. square and which are to be ceiled and roofed with a low segmental dome. The sanctuary forms another bay about 53 ft. square, also to be covered with a dome. Under this is the position of the high altar, and beyond the latter is the apse extending another 50 ft. (internal) and containing the accommodation for the choir. On each side of the first and second bays of the nave, on entering, are processional aisles about 11 ft. wide, and beyond these chapels; on each side of the third or last bay of the nave is a transept, and these occupy the width of the aisle and chapels. To right and left of the sanctuary are respectively the chapel of the Blessed Sacrament and the Lady Chapel. There are also a series of porches, narthex, and baptistery at the entrance (north) end and a crypt under the choir at the south end, besides two sacristies one above the other: these lie to the west of the crypt and choir.

The total outside length of the building is 360 ft. and the width 156 ft. The height from floor to the springing of the main arches is 60 ft., to the crown of the soffits 90 ft., and the segmental domes, which spring from about 2 ft. above that point, rise to a height of 112 ft. The tower will be about 280 ft. high by 30 ft. square.

The exterior of the building is faced with specially made narrow bricks from Messrs. Thos. Lawrence & Sons, of Bracknell, in combination with Portland stone dressings, and granite is used in the plinth and various other parts. The interior at present is entirely of brick and this will eventually be covered on the lower parts with marble veneer to harmonise with the small columns of solid marble which will support the galleries, and with mosaic on the whole of the surfaces above 37 ft. from the floor.

The design may perhaps be called Byzantine in feeling, and will no doubt be very grand, though at the same time very simple when complete. The foundation of the old Tothill Fields Prison, a bed of concrete 9 ft. thick, has been used for the foundation of more than two-thirds of the building. The southern portion of the site was found to be very soft, and the new foundations there had to be taken deep. The damp courses, both horizontal and vertical, have been formed of blue Staffordshire bricks. The domes are to be constructed of concrete, consisting of one part of Portland cement to four parts of brick broken to the "size of nuts." The pendentives, with the exception of a small portion at their points, which is to be of brick, will also be composed of concrete. The domes will vary from 2 ft. thick at the springing to 15 in. at the crown. They will be covered externally with slabs of artificial stone, formed specially to fit, and laid on ribs of concrete formed on the back of the real dome, thus leaving a space of 6 in. between the outer skin and the real dome. The latter will thus be protected from rain, and the church will also be kept cooler. The concrete will be laid on a continuous and complete centering, a model of which was on view, though not entirely finished.

The very elaborate and carefully executed model of the whole building was also on view. This was made in Messrs. Farmer & Brindley's workshops, and cost about 180*l*. Numerous working drawings were also to be seen, and were studied by those present with great interest.

The excavation and all works up to the ground level were carried out by Messrs. Perry & Co., and the superstructure is being executed by Messrs. Shillitoe, under a measure and value arrangement, on a contract schedule of prices.

Much information was kindly given by Mr. Mullis, the clerk of the works.

ARCHITECTURAL SOCIETIES.

SHEFFIELD SOCIETY OF ARCHITECTS AND SURVEYORS.—The usual monthly meeting of this Society was held on the 14th inst., at the School of Art, Mr. R. W. Fowler in the chair, when Mr. P. Marshall, F.S.I., gave a lecture on "Surveying." The lecturer prefaced his remarks by giving advice to the students upon the necessity of being careful and particular in all the work appertaining to the profession of a surveyor. He then proceeded with a detailed description of the work done by surveyors of 150 to 200 years ago, and the character and beautiful workmanship of the finished plans of that period, and illustrated the manner in which the surveys were carried out from that period to the beginning of the present century, and explained how the plans were prepared by these early surveyors and the various details connected therewith, contrasting the amount of labour expended upon the finished plans of that period with those prepared in these hurried times. After referring to the work done by the surveyors in the enclosures of the commons and waste lands of England, he gave a detailed description as to how the surveys of these commons were made, the manner of laying out the roads and dealing with the rights of way across the same, also the way in which the surveyors valued the commons for dealing with the commoners' rights, and also the allotting and setting out the plots apportioned to them. He also gave an outline of the work done by the Commissioners and the hearing of claims, and as to what these claims consisted of, being for various rights, such as those of pasture, horses, and sheep, the rights in respect of ancient enclosures, the tithe owner and the lord of the manor and his manorial rights, and explained how the lands were allotted in lieu of those rights. The different methods adopted in meeting the expenditure incurred by the Commissioners in their work were then shown. He described the various systems of modern surveying, and their application to the surveys of country estates and property in towns, and specially explained the applicability of traversing with the theodolite for these surveys, with advice as to how the same should be carried out. Proceeding, he laid down what in his opinion was the best mode of preparing Parliamentary plans for engineering and other uses, and in particular the making of the surveys required for the working plans for railways and other works. He next gave advice as to preparing the cartoons for Parliamentary and other purposes, whichare used in the illustration of works before committees of the Houses of Parliament and other tribunals, concluding his paper with a brief description of how the ordnance survey of England was carried out, and the details shown on the published maps. On the motion of Mr. Fred Fowler, seconded by Mr. C. Hadfield, and supported by Mr. H. Vickers, a hearty vote of thanks was given to the lecturer.

BRISTOL SOCIETY OF ARCHITECTS.—The monthly meeting of this Society was held at the Fine Arts Academy on the 15st inst., when the question of the competition for the proposed new library was discussed, and after hearing the report of the deputation to the Libraries' Committee, it was resolved that, in default of an independent professional assessor being appointed, the original determination not to compete be adhered to. Surprise was expressed that the Libraries' Committee had refused to accede to so reasonable a request, the ostensible intention of the competition being to obtain the best design. Mr. Arthur Lee, J.P., then read an interesting paper on "Marble Decoration," profusely illustrated by lantern views. He remarked that an eastern traveller once said that until he went to India he did not at all understand the artistic beauty of marble. As he spoke, he had before him the magnificence of the Taj Mahal, the most priceless and wonderful monument in the world, raised by the Emperor Shah Jehan to the memory of his wife. The Makrana marble, of which the Taj Mahal was built, looked its best under the gilding of the Indian sun or lit up by the softer rays of the moon in the marvellous manner which could only be witnessed in eastern climes. It was under such circumstances that a highly crystalline substance like marble obtained an added charm. Centuries before the building of the Taj Mahal, long before it was said of a Roman Emperor that he found Rome of brick and left it of marble, the Indian workers had attained a high degree of skill, and it was probably through eastern influence by way of Persia and Greece that the Romans obtained such a strongly pronounced taste for marble decoration. The importation of marble into ancient Rome must have been enormous, for during the whole of the Dark Ages, and down to comparatively recent times, Rome was the marble quarry of the world. Some of the early Popes were said to have destroyed more Roman buildings for their churches than the Goths, the Huns, and the Vandals put together. One of the earliest examples of this traffic was probably the Baptistry of St. John in Florence, although some authorities were of opinion that this building was more directly of Roman origin. Many of the columns and the marble used in the mosaics at the Church of St. Miniato, also of Florence, were undoubtedly of Roman origin. It was in the eleventh century that a custom grew up that had more or less since been practised in Italy, of decorating the walls of buildings in bands of striking contrast. Knight put this custom down to Saracenic influence. The Cathedral of St. Mark's at Venice was one of the richest illustrations of marble work in Europe. It contained more than five hundred pillars of Verde Antico, Porphyry, Serpentine, and some of the rarest marbles. Exterior and interior, ceiling and pavement, were encrusted with the rich materials. All that was not gold or bronze or mosaic was covered with the choicest marbles. One of the best known pieces of marble work in the Ducal Palace is the celebrated Giant's staircase, a fine piece of fifteenth century work. It was, perhaps, unfair to compare work of this kind with that which passed for decoration in some most pretentious buildings in this country. The owners of a fashionable London theatre, only recently, proudly stated that they were the possessors of "the best imitation of marble set up in this country," and to crown all that, "many competent judges have been deceived by it." One could imagine the criticism of the author of "The Stones of Venice" upon such a boast. At the seat of Earl Spencer, at Althorp, in the entrance hall there was an excellent specimen of what could be done with simple white marble. Another was to be found in Mayfair, at the house of Lord Burton, where the staircase was of Sicilian marble, and the hall paved with the same material, relieved with bands of dove. Gosford House, the seat of the Earl of Wemyss, was originally designed by the Brothers Adam, but it was left to an architect of our time, Mr. William Young, to convert it into a beautiful palace, and to erect the charming marble staircase which was its chief feature. Numidian marbles all took a high polish, and many of them were of singular beauty. In ancient times they were greatly prized by the Romans, but after the fall of the Empire the sources of supply were lost sight of, and these have only recently been re-discovered. Colonel Playfair, H.B.M. Consul at Algiers, was of opinion that the Roman Emperors carefully guarded the secret of these quarries, and that only comparatively small pieces were taken away. They were probably worked up into mosaics or used for other fine decorative purposes. Swiss cippolino had been used in the marble decoration of the Pump Room at the Clifton Spa. The quarries were situated in Switzerland, and a large capital had recently been sunk in opening them out, in making roads, and laying down plant. It is well to bear in mind that the beauty of coloured marble was seen to the best advantage in plain surfaces, and they ought generally to abstain from enriching mouldings with carving. In many of the darker marbles the effect of colour was so overpowering as to practically obliterate the forms of moulding executed in them; but whether light or dark marbles were used in mouldings, they should be uni-coloured and free from markings and veins, which destroyed the effect of mouldings by crossing them by inharmonious lines. It was a pity that Irish marbles were not more generally adopted. A beautiful green marble was obtained from quarries near Recess, co. Galway. It was serpentine, like the green marble of Genoa. Repeated attempts had been made to establish the quarrying industry in Galway, but the want of appreciative demand had hitherto been always in the way.

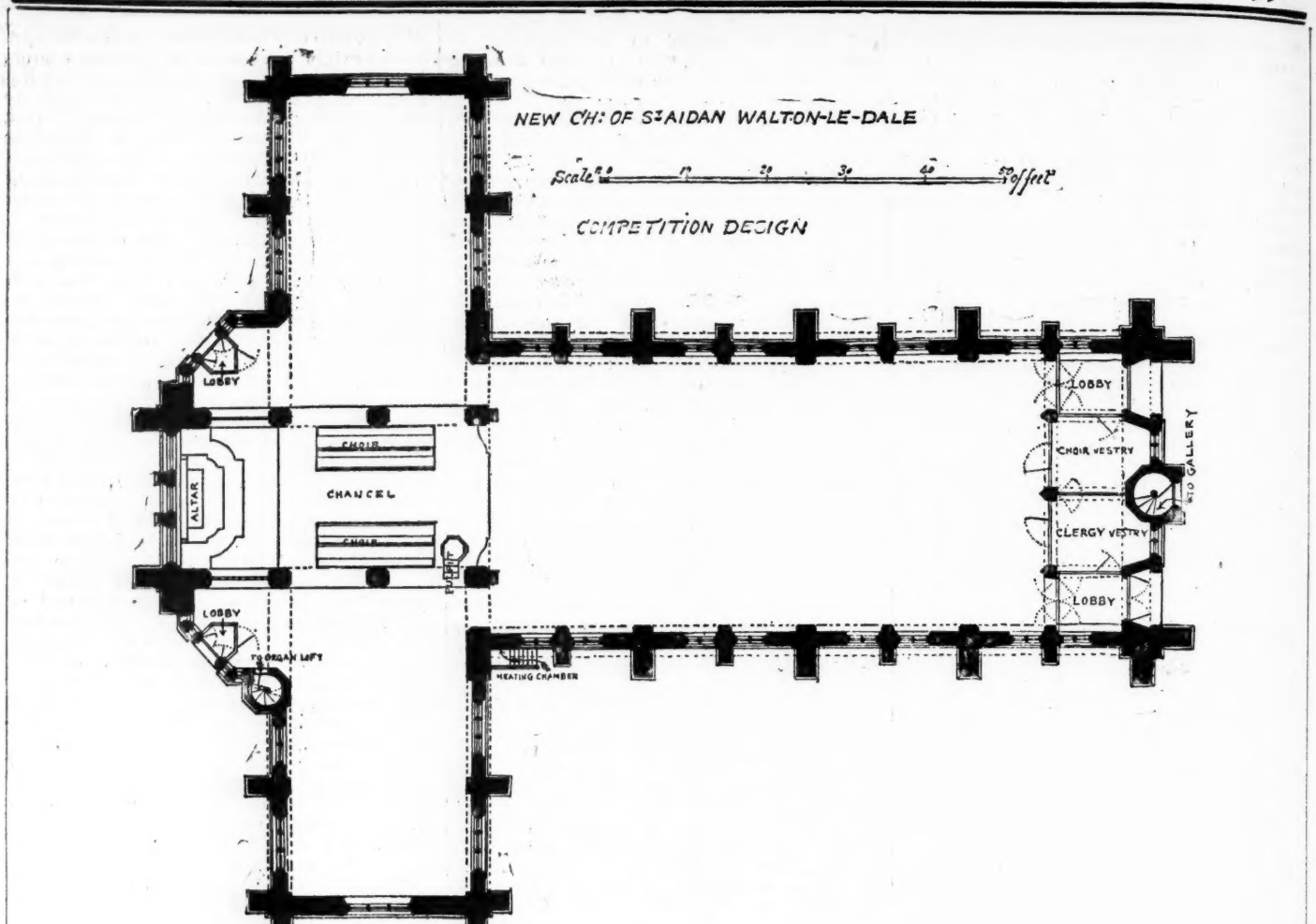
COMPETITIONS.

FIRE STATION, BRADFORD.—The premiums offered for plans for the new fire station at Bradford have been awarded by the Watch Committee as follows:—1st, Messrs. Mawson & Hudson, Bradford; 2nd, Mr. W. J. Morley, Bradford; 3rd, Mr. Owen Roberts, Liverpool. Forty-four sets of plans were sent in for the competition.

THE REBUILDING OF THE OLD BAILEY.—The City Surveyor (Mr. A. Murray) and Professor Aitchison (the President of the Royal Institute of British Architects) are engaged in preparing the instructions to the six competing architects who will be asked to submit the plans for a new sessions house in the Old Bailey.—*City Press.*

BOOKS RECEIVED.

DILAPIDATIONS. By Banister Fletcher. Fifth Edition. (B. T. Batsford.)



Illustrations.

ILLUSTRATIONS OF GREEK ARCHITECTURE.

WE give illustrations, from some excellent photographs lent by Professor Aitchison, of the remains of the Temple of Jupiter Olympius at Athens, a portion of the Doric order of the Propylæa, and the upper portion of the Ionic order of the Erechtheion. These may be of interest to turn to in connexion with some of the remarks in Professor Aitchison's Royal Academy lectures. The lecture printed in this issue being on the Ionic and Corinthian orders, the remains of the Erechtheion and the Jupiter Olympius furnish the finest examples of the details of these two orders. The Jupiter temple, it is true, was built under Roman rule, but probably by a Greek architect.

The example of the Doric of the Propylæa is taken from rather an unusual point, behind one of the short return colonnades at right angles to the main front, one of the columns of which is seen beyond The architrave thus appears with only the plain fillet above it, the triglyphs not existing on the inner side.

BRANCH BANK, BEDMINSTER, BRISTOL.

THE materials used in the front of this building are Bath stone and 2 in. red bricks, with a wide mortar joint. The woodwork and ironwork are painted white, except the front door, which is of teak.

The work was carried out by Messrs. Stephens & Bastow, of Bristol, under my supervision.

WALTER CAVE.

PROPOSED FRONT, 40, JAMES-STREET, LONDON.

IT is proposed to face this house with a rich green glazed brick ; the bay to be of Portland stone or fine faced Portland cement ; the gable, stack, cornices, &c., of Portland stone, and the woodwork painted white.

The interior of this house dates from 1683, this date being found on a stone let into the base of the chimney stack, and on an interesting lead cistern, which is further enriched with panels and flowers.

The plan is of interest as a specimen of the arrangements of a small house during Wren's time ; the large stack, about 9 ft. square, occupying nearly the centre of the house.

WALTER CAVE.

COMPETITION DESIGN FOR THE CHURCH OF ST. AIDAN, WALTON-LE-DALE.

THIS design, by Mr. A. H. Skipworth, was sent in competition for a proposed new church at Walton-le-dale.

The conditions were that the church should accommodate 400, with a provision for adding an extra 400 later on. The transepts were thrown out to provide the extra seating—200 each. For economy, the vestries were placed in the body of the church at the west end, the space over forming a gallery. The whole was to be built in stone, with some red brick bands on the exterior.

The design was exhibited at the Royal Academy in 1897.

DURNFORD MONUMENT, CHICHESTER CATHEDRAL.

THIS monument, to the memory of the late Bishop Durnford, was designed for erection under the easternmost of the two arches by which the chapel of St. Clement opens into the south aisle of the nave. These chapels at Chichester are a singular feature of the cathedral, and do not exist in other English Cathedrals, though they are common abroad. It is proposed to restore this, as well as the other chapels, in the future.

The materials employed in the monument are clunch from the Tottenhoe quarries, and Purbeck marble. The ceiling of the monument, forming the canopy over the figure, is richly groined. Each end is treated in three compartments, the side ones pierced, and the centre one occupied by a niche and figure ; St. Richard, Bishop of Chichester, at one end, and St. Wilfred, Apostle of this part of England, at the other end. The tracery of the head contains shields with the arms of the diocese and province.

The work was carried out by Messrs. Farmer & Brindley, from the design and under the superintendence of Mr. Thomas Garner. The effigy of the Bishop was modelled by M. Chevalliaud. The cost of the whole has been about 2,000*l*.

Ths drawing was exhibited in the Royal Academy of 1897.

THE SURVEYORS' INSTITUTION:

THE MANAGEMENT AND VALUATION OF BRICKFIELDS.

AN ordinary general meeting of the Surveyors' Institution was held on Monday in the temporary premises of the Institution, Savoy-street, Victoria Embankment, W.C., Mr. T. M. Rickman, Vice-President, in the chair.

The minutes of the last meeting having been read and confirmed, and some donations to the library and library fund having been announced,

Mr. J. L. Crouch read a paper on "The Management and Valuation of Brickfields." He gave some account of the geology of brick-earth ; mode of taking specimens ; analysis ; a resumé of brick-making as practised near the Metropolis, and a description of the implements in use ; the covenants of a brickfield licence ; the assessment and rating of a brickfield ; and, lastly, the valuation. As to the geology of brick-earth, brick-earths might be classified under three distinct heads—viz., clays, loams, and marls. They were all formed by the same process of Nature, being deposited either by the sea or rivers, and accordingly named marine and fluviatile deposits respectively. Taking the brick-earths individually, there were, firstly, the clays, which were in technical language termed hydrous silicates of alumina. The purest form of clay was termed kaolin, and was commonly known as china clay. The general percentage theoretically of clay was:—Alumina, 39·8 per cent. ; silica, 46·3 per cent. ; water, 13·9 per cent. This was the theoretical percentage, but in practical analysis the percentages would be found to vary considerably. The minimum and maximum percentages of the components of kaolins in general below which or above which the material ceased to be regarded as kaolin were :—Alumina, from 37·7 to 40·7 ; silica, from 43·6 to 46·53 ; water, from 9 to 14·54 ; iron oxide, from 0 to 1·5 ; lime, from 0 to 3·5 ; magnesia, from 0 to ·44 ; potash, from 0 to 1·9. It was important to remember that this pure clay would shrink and crack in drying and firing in proportion to the excess of alumina to silica. This could be remedied by adding sand. The distinctive characteristic of clay was its plasticity, which depended upon the interstitial but not chemically combined water ; for though a powdered brick would absorb a great deal of water, it was impossible to make it in the least degree plastic. The degree of plasticity

depended upon the fineness of the particles in the clay. Kaolin was derived from the decomposition of granite occurring in two stages known as china-clay and china-stone, and granite, to go a little further back in geological order, was composed of three minerals, quartz, felspar and mica. In the process of decomposition from granite into kaolin the quartz remaining unchanged was mechanically washed away, as for instance by the action of running water. At a later stage than the felspar mica chemically changed to some extent, but it should be either absent (from the same mechanical washing away) or should be colourless and non-ferruginous. The difference between china-stone and china-clay consisted mainly in the greater softening in the latter of felspar, by conversion into clay. Felspar in granite was an anhydrous (or nearly so) silicate of alumina with a silicate of potash and occasionally soda. Kaolinising was a term used for the process of decomposition, and was generally described as resulting from the action of carbonic acid in the atmosphere upon the silicates of potash or soda, removing them as soluble carbonates, whilst the moisture in the atmosphere united with remaining silicates of alumina to form kaolin.

Having given further information about, and described the process of manufacture of, china-stone and china-clay, the author dealt with pipe, and pottery clays. In the manufacture of porcelain the kaolin and other ingredients were ground up into an impalpable powder, flint and lime being added and worked up together in water by spades and mallets and kneaded by the workmen. In this state it was called dough, and was kept damp till required for the potters' wheel and lathe. When moulded, the articles were slowly dried, and afterwards taken to a kiln for preliminary baking into what was termed "biscuit." In the well-known Sèvres ware the proportions were:—Kaolin, 63 per cent., and 70 per cent.; felspar, 22 per cent., and 15 per cent.; flint, 10 per cent., chalk, 5 per cent. or 6 per cent. For coarse pottery, the clay was worked with water and tempered. The shaping was done on a wheel and the article dried under cover. The glazing was generally effected with a cream of pulverised galena, that was lead sulphide or the ordinary lead ore. After being again dried, it was gradually heated, and in this process the sulphur of the galena was driven off, producing an oxide of lead which formed, in chemical combination with the alumina, a lead glass. For the Staffordshire ware, known as stoneware, common salt was an ingredient in the glazing. For a still finer glaze than any of these, a composition was made of red and white lead, felspar, silica, and flint glass, in varying proportions. Loams were mixtures of clay and sand, and geologically must have had a sufficient quantity of sand to allow water to percolate through to prevent binding. Marls were defined as "clays containing a distinct proportion of lime," and a great authority had placed the maximum limit of lime in marls for brickmaking at 2 per cent.

The author then gave the ingredients of fire-clays and the result of analyses. A fire-brick of excellent quality, selling from 50s. to 55s. per thousand, was composed of 40 per cent. of silica, 37 per cent. of alumina, 2 per cent. of magnesia, 9 per cent. of potash, and 12 per cent. of water. In the Dinas fire-clay from South Wales, the ingredients were 91·95 of silica, and 8·05 of alumina. Samples of the earths could be taken by test holes or by boring. Before visiting the ground for the purpose of obtaining samples, it was desirable to ascertain, if possible, the nature of the soil, if any, overlaying the clay; this might save the carrying of unnecessary tackle. The borers were simply large gimlets, some being spiral others straight, and used according to the nature of the work to be performed. It would be found that the straight or straight-grooved work the easier, though the specimens taken were not so well preserved by them. The spiral would take out a complete section of the earth bored without disarrangement, but the straight borers were apt to break the specimens by their action forcing the earth up the groove instead of merely taking out a complete section as the spiral borer would do. If the object was only to ascertain the depth of the earth the straight borers were sufficient, but in other cases preference might perhaps be given to the spiral form. The borer was fitted at the top with a screw hole to take lenthening bars. It was generally 5 ft. long, the twist or gouge being about 2 ft. or 3 ft. of this length, and the remainder of it square, and a handle was attached by nuts and bolts. Two assistants then proceeded to drive the borer into the ground by screwing it in the same fashion as an ordinary gimlet by revolutions. It would generally be found advisable to surround the bore-hole with boards for the assistants to walk upon in order to prevent the earth being pressed into the hole when the borer was withdrawn. About 1 ft. of earth was the most convenient amount to remove at one time; the borer should then be carefully withdrawn by pulling or lifting it out. If too stiff to pull out by hand it could generally be raised with the shoulder under the handle. Just before the borer finally left the hole any loose earth round the mouth should be brushed away to avoid any of the top soil becoming mixed with the sample. The surveyor must use his own discretion as to the number of sections he took, but clay varied so considerably in many cases within a short distance, that nothing was lost by taking several specimens. It was not as a rule homogeneous over large areas, even in adjoining fields, and in the same field might vary to a considerable extent in composition, texture, and colour, frequently containing layers or pockets of gravel or very coarse sand. No doubt the best test of the quality of the earth was the quality of the brick or other article it would make; a practical test was therefore desirable. It must be borne in mind that a good deal of the value of the clay depended upon the cost of getting it; therefore care was essential in noting the nature and thickness of any overlaying soil. Having, however, attended to all these matters, the analysis had to be made. It would be found that no chemical analysis was required; except in the case of the alkalies soda and potash, which were analysed chemically. The usual method, other than chemical, employed for a qualitative and quantitative analysis of the materials was then dealt with by the author, after which he dealt with the actual manufacture of bricks as carried on in the neighbourhood of London, with an account of the materials and plant in use. Marl was suitable for manufacture into bricks without any addition; this had placed it in great demand and accounted for its present scarcity. As a substitute, an artificial marl had been made for making the best qualities of bricks by mixing chalk and clay together, which, after being reduced to pulp, was run off into pits and allowed to remain till sufficient consistency was obtained. The clays used for brick making around London were mostly loams, and they had to be treated according to the varying proportion of clay and sand. Silica should be present to the proportion of three-fifths, alumina one-fifth, the remaining fifth being made up of iron, lime, manganese, magnesia, soda, and potash. If too sandy, lime or chalk was added as a flux, preventing the shrinking and warping which would otherwise occur in drying and burning. If too stiff—that was too clayey—sand was added to the required amount. The chalk to be added was always reduced in a mill to the consistency of cream. The final colour of the brick was determined partly by the proportion of hydrated oxide of iron and partly by the degree of the heat in the burning. If lime be absent the moderate heat would produce a red colour, the iron oxide being the colouring matter, the intensity of the red varying with the proportion of the iron. This iron could be added mechanically in the form of oxide. With intense heat the red brick becomes a blue brick. The presence of lime acted upon the oxides, producing the cream brown or yellow colour of the ordinary stock brick, and uniformity of colour was frequently attained only by a too generous addition of chalk (or lime) at the expense of soundness and durability. Magnesia arrests the development of the red. If the earth was found to be free from stones or pebbles, it could be used without washing; but should either of these be present in such quantities as to render manual labour insufficient, a process known as washing must be resorted to, which was at once tedious and expensive. It consisted of filling a trough with the clay, and adding sufficient water to run the clay through a grating or sieve into pits, where it remained until the necessary consistency was arrived at by evaporation and drainage.

The actual brickmaking was commenced about April, but the clay should be dug up the previous autumn for the purpose of allowing the winter frosts to break it up. A considerable saving of labour was effected by this operation, and it was absolutely essential to the proper preparation of the earth, neglect of it being attended by the Nemesis of inferior bricks. The process of burning bricks in open clamps (the name by which the stacks were known) was peculiar to the London brickmaker, and to make the process successful it was considered necessary to mix the fuel with the brick earth. The fuel known as "soil" consisted of the ashes from the dust-bins of adjacent towns. These were sifted through a screen, mixed up thoroughly, and incorporated with the brick-earth. When the moulded brick was put into the clamp, the soil itself actually burns. It was said that the ashes, which give off sulphur, improve the colour of the bricks; they also assisted in arresting contraction, so altogether they might be considered a very useful and ingenious addition. About thirty-five chaldron are used in 100,000 bricks. The moulder was the man who actually moulds the clay, and his work was confined to the summer months, and during this time he would mould somewhere about 750,000 to 1,000,000 of bricks. The moulder stands in front of a table, and close in front of him is placed the pug mill. This was a conical-shaped tub with the larger end uppermost, fitted with a spindle to which were attached knives arranged horizontally, with the blade fixed in a slanting direction. In addition to the knives, the spindle was fitted with spikes. The soiled earth was put into the pug mill by the temperer, and the spindle was caused to revolve by horse-power or machinery as the case might be. The earth by this means became thoroughly mixed up, and was forced by the action of the knives to the bottom of the mill, and thence through a hole, a convenient-sized piece being cut off with a knife called a cuckhold by a boy who lifted it on to the moulding-table, to the right of the moulder. The moulder had on his left the stock board, fixed to the table. This was the bottom of the mould, and was made of wood shaped to produce the frog or indentation to the brick. Over this was placed the mould; this was the width and length of the intended brick; the depth was generally greater, and to obtain the requisite thickness nails were driven into the table at the four corners of the stock board, and upon these the mould rested, the nails being fixed higher or lower in order to regulate the thickness. The moulder now took sifted sand which had been thoroughly dried and threw some into the mould to prevent the clay sticking to the mould. This sand assisted in giving a face to the brick and answered other practical requirements. The moulder next took a piece of clay and threw it violently into the mould, pushing it thoroughly home with his fingers. The spare clay was then removed by a striker. When this was done, the moulder placed a pallet ontop of the mould. Pallets were plain pieces of board usually about three-eighths of an inch thick, of the same width as the mould, but slightly longer. With this the newly-moulded brick was taken off the stock board and put, pallet undermost, on to a little erection called a page, a contrivance formed of two rods of iron about three-eighths of an inch wide and about six or seven inches apart, nailed to a board sloping away from the moulder. The moulder then pushed the pallet a few feet down the page whence it was removed and placed upon the off-bearing barrow, which was of a special design, consisting of a light frame on springs to avoid, so far as possible, injuring the newly-made brick. These barrows usually took twenty-six bricks in two rows. The barrow, sometimes called a hack-barrow, was then wheeled to the drying ground, where the bricks were placed in long lines, known as hacks, the length depending upon the space available, and about 11 ft. apart from centre to centre. Along the length of the hacks were placed lengths of sheet-iron about ⅜ in. thick and 6 in. wide, on which the barrows were wheeled. When the raw bricks were sufficiently dry they were put into the clamp to burn, and when thoroughly burnt they were removed in crowding barrows to the carts, barge, or other conveyance. In laying out a brickyard it was advisable to place the clamp in a lower part of the field than the stool, the intermediate distance being occupied by the hack-ground. Circumstances might, of course, prevent this, but this arrangement would be found to save considerable labour in wheeling. It must not be understood that there were no other methods of manufacturing bricks. Red bricks were extensively made by machinery and moulded by hand and baked in kilns, but

into the many different methods and the many different machines he could not enter. In some factories the earth, after being dug, was never touched again until the completed bricks tumble out four at a time as fast as they could tumble.

The author then dealt with the covenants of a lease of a brickfield, the rating of brickfields, and the valuation of a brickfield.

On the motion of Mr. Josling, seconded by Mr. F. B. Butland and supported by Messrs. G. Wragg and T. Robson, a vote of thanks was unanimously passed to Mr. Crouch.

The meeting then terminated.

ARCHÆOLOGICAL SOCIETIES.

BRITISH ARCHÆOLOGICAL ASSOCIATION.—At the meeting of this Association, held on the 15th inst., Dr. W. de Gray Birch in the chair, Mr. Andrew Oliver exhibited a fine example of a bronze mortar, date 1598, beautifully chased with Renaissance ornamentation, also an altar cross of wood of the seventeenth century. Mr. Dack, of Peterborough, brought for exhibition some examples of valentines of the early years of the present century. Professor McKenny Hughes, of Cambridge, gave a most interesting lecture, being the substance of a paper he had prepared upon "The Fens," intended to have been read during the recent Congress at Peterborough had not unavoidable circumstances intervened. The Professor first explained the changes in the physical geography of the district which had resulted in the formation of the land-locked area over which the fen deposits had been laid down and the changes of level which had affected it. He then gave a sketch of the inhabitants of the fen land and its borders from the earliest appearance of man to the present day. He did not recognise eolithic or palæolithic man, and referred palæolithic man to an age before the fens as we knew them existed; no traces of palæolithic man having been found in the peat or the associated deposits. The neolithic and bronze folk were the people of the time of the greatest development of the fens. The Romans began to modify the fens and control the upland and tidal waters by embankments. After the natives had been defeated in battle came a time of peace and progress, and well-to-do Romans and Romanised British lived in and around the fens in safety. The Professor traced their distribution and that of the succeeding people by their remains, and indicated upon several large scale maps the various districts colonised by them and concluded by noticing some of the characteristics of the Fenland and the dwellers therein at the present day. Many objects of great interest found in the fens illustrated the lecture, consisting of prehistoric flint and bone implements. A neolithic flint implement was found sticking in the skull of a urus, but no palæolithic implement had been met with sticking in any animal. The skull of a man of the early bronze age, in good preservation, and several horse shoes, large and very broad for the purpose of giving a firmer footing on the yielding soil, were amongst the exhibits. In the discussion following the paper, Dr. Birch, Mr. Blashill, Mr. Kayson, Mr. Dack, Mr. Cecil Davis, Mr. Park Harrison, and others took part.

SOCIETY OF ANTIQUARIES OF SCOTLAND.—The usual monthly meeting of this Society was held in their library at the National Museum of Antiquities, Queen-street, on the 13th inst., the Hon. John Abercromby, V.P., in the chair. In the first paper, Mr. Thomas Ross, architect, F.S.A.,Scot., gave a notice of James Gifford, a local sculptor, who practised his calling at West Linton in the latter half of the seventeenth century. Several of his works still remain in the village, and a number are in the possession of Sir James Ranken-Fergusson, Bart., at his mansion house of Spitalhaugh. The paper was illustrated by drawings of the principal works of Gifford still remaining in Tweeddale. In the second paper, Mr. F. C. Eeles gave a notice of a portion of a sculptured slab bearing a Celtic cross recently found in the churchyard of Kinneff, and now presented to the Museum. Kinneff Church, famous as the place of concealment of the Regalia of Scotland in the seventeenth century, is one of the oldest foundations on the east coast of Scotland, although its early history is very obscure. The original dedication appears to have been to St. Adamnan. The fragment of this sculptured slab was found among stones taken from the north wall of the church, and bears on one face a cross of the usual Celtic form, with semi-circular hollows at the intersections, and having a small boss in the centre, with corresponding bosses on the arms and summit. Comparing the cross with that sculptured on St. Wolde's Stone at Logie Coldstone, which it most nearly resembles, the author came to the conclusion that it must be assigned to a rather late date in the second Celtic period. In the third paper Mr. Angus Grant, Drumnadrochit, described a curious stone cup, with a footstalk, the whole exterior of which was boldly carved with leafage, which was ploughed up about twenty years ago on the farm of Balmacaan, Glenurquhart. In the fourth paper, the Rev. George Wilson contributed a list of the antiquities of Glenluce, Wigtownshire, with plans and descriptive notes, from materials accumulated during many years, but chiefly between 1868 and 1882, enumerating them under the heads of old castles or manor houses, ecclesiastical remains or sites, including sculptured stones and holy wells, mote hills, forts, hut circles, lake dwellings, standing stones, and cairns. In the last paper, the Rev. R. S. Mylne gave an account of the King's Master Gunners of Scotland, with the writs of their appointments from 1512 to 1703.

THE DISPUTE IN THE LONDON BUILDING TRADE.

ON the 1st of this month the National Association of Master Builders addressed a letter to the Secretary of the Plasterers' Union requesting an official and definite assurance that certain objectionable practices complained of by the masters should be discontinued. A reply to this letter was desired by the 14th inst., and on the 15th inst. the Standing Committee of the Masters' Association met at Derby to discuss the answer received. The letter sent by Mr. Deller, the plasterers' secretary, was not considered at all satisfactory, and the meeting decided to give the union a few days in which to reconsider its decision.

A special meeting of the Standing Committee of the National Association of Master Builders was held at the offices of the Central Association, in Bedford-street, Strand, on Wednesday, for the purpose of finally deciding upon the line of action to be taken in the dispute. The meeting was presided over by Alderman Holdsworth, of Bradford, and all the members of the Standing Committee elected specially to deal with the matter were present.

The correspondence which has passed within the course of the past few weeks between the officials of the Masters' Association and the secretary of the Plasterers' Union was brought up for consideration. From this it appeared that the employers had asked for an assurance from the National Association of Operative Plasterers that the following objectionable practices should be discontinued :—

1. *(a)* The persistent attempt to coerce foremen of plasterers or superintendents of plasterers into the membership of the National Association of Operative Plasterers; also *(b)* the threat to withdraw all members from the building firms employing such foremen or superintendents. 2. The limitation of apprentices. 3. *(a)* The practice of boycotting certain building firms and employers of plasterers, in spite of the fact that such firms adhere to the rules agreed between the Master Builders' Associations and the National Association of Operative Plasterers; *(b)* the practice of printing and circulating, amongst the members of the N.A.O.P., a list of such firms for whom they are forbidden under penalty to work. 4. The refusal to work on buildings where some of the workmen employed may not belong to a trades union. 5. (*a*) The refusal to accept the decision of the employer as to which workmen shall do certain work, in cases where plasterers dispute with other trades as to their right to do such work; (*b*) The practice of withdrawing all their members when such work may not be placed in the plasterers' hands. 6. The objection to submit all trade disputes to discussion at a conference, between employers and employed, with a view to arrive at an amicable settlement prior to any strike or withdrawal of workmen.

The letter of the National Association Secretary, asking for this assurance, stated that the agreement of the Plasterers' Union to this course must be intimated by February 21, otherwise a general lock-out would be declared at an early date.

In reply, Mr. Dellar stated that a ballot of the whole of the plasterers on the questions in dispute would be taken on February 25, and the result would be made known on March 1. The ballot was to be separate from and subsequent to the original ballot, which only asked the members to decide upon the withdrawal of the non-union foremen protest.

With these letters before them on Wednesday, the representatives of the Masters' Association resolved to send a reply to Mr. Dellar in the following terms :—

"Unless there exists a determination on the part of your association to persist in the objectionable practices set forth in my letter of February 1, 1899, there can be no reason why the assurances required should not have been given at once. I am, therefore, instructed to inform you that my association has decided to declare a lock-out against the members of your association on Monday, March 6, and that this lock-out will remain in operation until your association will guarantee that the said objectionable practices shall cease. In the meantime, any communication received from you will, of course, receive the attention of my association."

This letter was signed, on behalf of the masters, by the National Association's secretary.

A manifesto was issued by the executive of the Plasterers' Union on Wednesday, placing before their members the steps leading up to this dispute. Reference was made to a fund established by the employers.

"Hence," continues the manifesto, "we presume, the reason they have included in their demands terms which they know perfectly well cannot be accepted by any body of trades unionists without sinking the manhood of its members. . . . Their first demand having been granted, we turn to the limitation which is something that somewhat puzzles us, seeing such limitation, if any, is entirely on their part; they are actually refusing to apprentice any boys to plastering, stating their ability to obtain a sufficient number of plasterers from the provinces to meet their demands. So you will see that upon their own showing the supply is equal to the demand. No. 3 (*a*) is in itself absurd, to think that any union would boycott any firm who adhered to the rules as laid down by its members and their employers; and No. 3 (*b*) is equally so, inasmuch that no respectable and honest firm can possibly have any objection to our publication of a list of firms and members against whom we, as an association, have a temporary objection, which is also our legal right and one freely adopted by the objectors, as we have in the past had ample evidence. No. 4 comes under a similar category, and we challenge them to point to any instance where our association has acted in such a manner simply because some other workmen, presumably of other trades, were not members of a trade union. No. 5 (*a*) is clearly answered in our reply, but we would add that there are possibilities that a large number of builders are not practical workmen of any grade in the building trade and therefore unable to act as competent judges in these matters. No. 5 (*b*) needs no further comment than our reply thereto, neither does No. 6. . . ."

THE INCORPORATED INSTITUTE OF BRITISH DECORATORS.

THE idea of forming an Institute for those engaged in the Art and Business of Painted Decoration, and having objects allied to those with which the Institutes such as those of Engineers, of Architects, and of Surveyors have been formed, seems to have originated within the present decade, and to have taken more definite shape at a meeting of the "National Association of Master Painters" at Manchester in 1894. Endeavours were made to obtain a charter last year; but, objections being found, it was decided to incorporate the Institute under the non-trading clauses of the Limited Companies' Act; and, after some years of persevering effort, the Institute was finally registered as incorporated on January 21 this year. The first meeting of the Provisional Council since incorporation was held at Painters' Hall on February 8. This Council, consisting of twenty-five members, is representative of England and Wales, Scotland and Ireland, Mr. Crace, of London, being President. It at once proceeded to elect officers and arrange for the organisation and working of the Institute. Mr. W. H. Pitman was elected treasurer; Mr. G. Petter, auditor; and Mr. F. W. Englefield (of Messrs. Pritchard, Englefield & Co., solicitors) secretary. The first general meeting is appointed for March 23 at Painters' Hall, Little Trinity-lane, where the new Institute's headquarters will for the present be situated.

In noticing the definite formation of this Institute, we may add that we are informed that although it will have its headquarters in London, its origin and preliminary organisation are almost entirely due to the initiative and the persevering efforts of representatives of the

northern counties, and also of Scotland, where Mr. Thomas Bonnar of Edinburgh and Colonel Bennett of Glasgow have been its constant and energetic supporters; most valuable assistance has also been rendered by the interim secretary, Mr. W. B. Crawford, of Glasgow.

THE LONDON COUNTY COUNCIL.

THE usual weekly meeting of the London County Council was held on Tuesday, in the County Hall, Spring-gardens, Mr. T. McKinnon Wood, Chairman, presiding.

Loans.—On the recommendation of the Finance Committee, it was agreed to lend the St. Pancras Vestry 12,000*l.* for electric lighting purposes; the Islington Vestry 14,285*l.* for the same purpose; and the Poplar Overseers 2,500*l.* for alterations and additions to the Town Hall.

Stabling at Tramway Depot.—The Highways Committee reported, and it was agreed:—

"That the estimate of 17,000*l.* submitted by the Finance Committee be approved; and that the Council do sanction the expenditure of a sum not exceeding 17,000*l.* in respect of the erection by the North Metropolitan Tramways Company, under the supervision and to the satisfaction of the Council's architect, and in accordance with plans to be approved by him, of additional stabling accommodation over the car-shed at the Cressy-road, Hampstead, depot, the freehold property of the Council and leased to the Company, such additional stabling being required for the use and accommodation of the company under its lease from the Council, dated October 14, 1897."

Battersea Park-road Widening.—The Improvements Committee recommended, and it was agreed:—

"That the Council do apply in the next session of Parliament for exemption from the operation of the 92nd Section of the Lands Clauses Consolidation Act, 1845, to enable the Council to acquire merely the forecourts of the properties Nos. 326 and 328, 330, 332, 334, and 336, Battersea Park-road, numbered 7, 6, 5, 4, and 3 on the deposited plan of the Battersea Park-road improvement (parish of St. Mary, Battersea) sanctioned by the London County Council (Improvements) Act, 1897."

Drainage, &c., Works.—The following recommendations of the Main Drainage Committee were agreed to:—

"That the estimate of 2,000*l.* submitted by the Finance Committee be approved, that an additional gas-engine and centrifugal pump be obtained and erected at the Heathwall pumping station, and that the Engineer be instructed to prepare the necessary drawings and specifications."

"That the supplemental estimate of 200*l.* submitted by the Finance Committee in respect of the electric light installation at the Crossness outfall be approved; that an expenditure of 150*l.* be sanctioned by the Council for the work of laying foundations for the engines and dynamos; that the tender of Mr. E. Proctor, amounting to 195*l.*, for the formation of the accumulator room be accepted. . . ."

"That the tender of Mr. Benjamin Goodfellow, amounting to 22,400*l.*, for converting four beam engines at the Crossness outfall into triple expansion engines be accepted. . . ."

"That the tender of Mr. J. M. Henderson as amended, and amounting to 213*l.* 10s., for the manufacture, delivery, and erection of a five-ton over-head traveller at the North Woolwich pumping-station be accepted. . . ."

Horton Estate.—The estimate of 2,000*l.* was approved for the acquisition of land for the purposes of railway siding No. 1 on the Horton Estate. The Asylums Committee reported as follows in reference to the Horton Asylum:—

"On July 19, 1898, the Council decided, on our recommendation, that the erection of the superstructure of this asylum should be carried out without the intervention of a contractor, and referred the plans and specification to the manager of the Works Department for this purpose, the manager's estimate for the work being 284,445*l.* We now report for the information of the Council that we have decided that certain improvements of the original plans shall be carried out. These improvements consist of the enlargement of the ward sculleries throughout the asylum, the provision of additional coal places, the re-arrangement of the housing of the assistant medical officers, matron and other female officers, and the building of a separate nurses' block, together with a few minor alterations. Though the variations are considerable, involving about 40,000*l.*, the architect estimates the cost of extras over omissions at approximately 4,500*l.* only. Mr. Hine, the architect, agreed to prepare the plans and supervise the carrying out of the work of this asylum for an inclusive fee of 5,750*l.* in consideration of the plans being duplicates of the Health Asylum (Bexley) design. As, however, the before-mentioned alterations will necessitate a re-modelling of the plans, and will affect more or less the majority of the working drawings for which new elevations, plans, and sections will have to be made, we have agreed to pay him a commission of 5 per cent. on all new work involved, such commission, however, not to exceed the sum of 1,000*l.*"

Light Railways.—The Parliamentary Committee recommended that they, in conjunction with the Highways Committee, be instructed to take the necessary steps to oppose the Finchley, Hendon, and District; Hampstead, Finchley, and Edgware; and Highgate, Finchley, and Wood Green Light Railway orders.

The recommendation was agreed to.

Mechanical Traction on Tramways.—The Highways Committee recommended, and it was agreed:—

"That, subject to the passing of the annual maintenance votes for the year 1899-1900 in respect of matters under the charge of the Highways Committee, the Council do approve the expenditure of the sum of 630*l.* for expert advice and assistance to be rendered by Mr. A. Kennedy, F.R.S., with reference to the system or systems of mechanical traction, other than steam or cable, most suitable for experiments upon the Council's tramways, such sum to include the expenses of investigation being made by him into the systems of mechanical traction in use in other cities and towns."

Electric Lighting for the Victoria Embankment and Westminster Bridge.—The same Committee recommended, and it was agreed,

"(*a*) That the tender of Messrs. McClure & Whitfield for the supply, for the sum of 3,726*l.* 5s., of the dynamos, switchboards, &c., required in connexion with the electric light installation for the Victoria Embankment and Westminster Bridge, be accepted; that the solicitor do prepare the necessary contract to give effect to the tender; and that the seal of the Council be affixed to the said contract when ready.

(*b*) That the tender of Messrs. J. E. H. Andrew & Co., Limited, for the supply, for the sum of 1,900*l.*, of the gas-engines, &c., required in connexion with the electric light installation for the Victoria Embankment and Westminster Bridge, be accepted; that the solicitor do prepare the necessary contract to give effect to the tender; and that the seal of the Council be affixed to the said contract when ready."

Having transacted other business, the Council adjourned.

APPLICATIONS UNDER THE LONDON BUILDING ACT, 1894.

AT the meeting of the London County Council on Tuesday, the Building Act Committee brought up the following list of applications under the 1894 London Building Act. Those applications to which consent has been given are granted on certain conditions.*

Lines of Frontage.

Marylebone, West.—Additions in front of Paddington Chapel, Marylebone-road, St. Marylebone (Mr. A. Conder, for the Rev. J. O. Davies).—Consent.

Marylebone, West.—Two four-story bay windows to No. 8, Northumberland-street, St. Marylebone (Mr. B. Pite, for Messrs. Matthews Brothers).—Consent.

Brixton.—An iron and glass shelter at the Empress Theatre, Brighton-terrace, Brixton Rise, Brixton (Messrs. Wylson & Long, for Messrs. Burney & Grimes).—Consent.

Greenwich.—Buildings on the south side of Dutton-street, Greenwich, to abut also on Maidenstone Hill (Mr. A. Roberts for Messrs. Nokes & Nokes).—Consent.

Hampstead.—That the application of Dr. J. R. Day for an extension of the periods within which the erection of a house with a projecting bay-window and porch, and also the erection of stabling, &c., on the west side of Frognal, Hampstead, at the corner of Arkwright-road, was required to be commenced and completed, be granted.—Agreed.

Hampstead.—A church on the northern side of Agincourt-road, Gospel Oak, Hampstead, at the corner of Lisburne-road (Mr. B. Pite for the trustees for the erection of the Gospel Oak Wesleyan Chapel).—Consent.

Islington, South.—An angle turret to a proposed building on the site of Nos. 40 and 41, Richard-street, Islington, at the corner of Liverpool-road (Messrs. Bird and Walters for Mr. W. A. Hayward).—Consent.

Lewisham. — Re-building of the "Two Brewers" public-house on the west side of Perry-hill, Catford, at the corner of Clarens-road, and the erection of four houses with shops on the west side of Perry-hill, adjoining the public-house (Mr. R. Cruwys for Mr. E. J. Janes).—Consent.

Southwark, West.—A one-story building upon part of the forecourts of Nos. 24, 26, and 28, Gravel-lane, Southwark (Messrs. Nevinson & Newton for Messrs. Stevenson & Howell, Limited).—Consent.

Strand.—Three temporary wood and glass show cases in front of No. 1, Piccadilly-circus, St. James's (Mr. A. Oldcorn).—Consent.

Woolwich.—Two cottages on the south side of Nightingale-vale, Woolwich, between Dicey-street and Jackson-street (Mr. J. O. Cook for Mr. H. S. Brading).—Refused.

Brixton.†—That Mr. G. Baines be informed that the Council is not prepared to accede to his request for consent to retain a wooden porch at the Old Baptist Union Hall, 5, Sidney-road, Stockwell, beyond the general line of buildings, and that the solicitor do continue the proceedings directed to be taken in the matter.—Agreed.

Brixton.—An iron and glass illuminated sign at the "Grosvenor Arms" public house, Sidney-road, Stockwell (Mr. J. C. Christie for Mr. G. R. Park).—Refused.

City of London.—Two angle turrets to a proposed building on the site of Vulcan Wharf, on the south side of Upper Thames-street, City, adjoining Puddle-dock (Mr. C. Reilly for Mr. A. Bird).—Refused.

Clapham.—One-story shops on part of the forecourts of Nos. 181 and 183, Lavender-hill, Battersea (Mr. C. H. Brodie for Mr. H. B. Atkinson.)—Refused.

Clapham.—An iron and glass shelter at the entrance to No. 21, Macaulay-road, Clapham (Messrs. H. & C. Davis & Co., Limited, for Mr. J. T. Young).—Refused.

Hackney, Central.—Two blocks of residential flats, with shops, on the west side of Lower Clapton-road, between Holly Lodge and Maitland House (Mr. A. Bedborough for Mr. W. Andrews).—Refused.

Islington, East.—A one-story shop at the side of No. 368, Essex-road, Islington, to abut upon Ockenden-road (Mr. R. Jay).—Refused.

Kensington, South.—That Messrs. Richardson & White be informed that the Council is not prepared to accede to their request on behalf of Messrs. Campbell, Johnstone, & Co., Limited, for permission to retain certain projections (illuminated signs) at the "Duke of Sussex" public-house, Uxbridge-street, Kensington, unlawfully extended from a building beyond the general line of buildings in the street, and that the solicitor do continue the proceedings directed to be taken in the matter.—Agreed.

Norwood.—Buildings on the western side of Herne-hill, Lambeth, between No. 36 and Rollscourt-avenue (Mr. H. A. Brown).—Refused

Width of Way.

Newington, West.—A billiard-room at the rear of the "Virginia Plant" public-house, No. 82, Great Dover-street, Newington, within the prescribed distance from the centre of Lawson-street (Messrs. F. J. Eedle & Meyers for Mr. H. A. Weston).—Consent.

Rotherhithe.—A one-story building on the east side of Tulip-place, New Church-street, Bermondsey (Mr. W. Freeman for Messrs. Mackey, Mackey, & Co., Limited).—Consent.

Bethnal-green, South-west.†—A building on the south side of Newport-street, Bethnal-green, to abut also upon Coventry-street (the Rev. A. R. Clemens).—Refused.

Clapham.†—A one-story building at the rear of No. 81, Altenburg-gardens, Lavender Hill, Battersea, at less than the prescribed distance from the centre of Green-lanes (Mr. H. Bignold for Mr. H. Hubbard).—Refused.

Hackney, South.—The rebuilding of No. 21, High-street, Homerton, at the corner of Plough-lane, and certain deviations from the plans certified by the District Surveyor (Mr. I. Mason for Mrs. C. Rix).—Refused.

Southwark, West.—A building on the yard in front of No. 17, Bankside, Southwark (Messrs. Fowler & Hill for Messrs. Beck & Pollitzer).—Refused.

Space at Rear.

Clapham.—That the Council, in the exercise of its powers under Section 41 of the London Building Act, 1894, do not allow a modification of the provisions of that Section with regard to open spaces about buildings, so far as relates to the proposed rebuilding of No. 124, High-street, Clapham, with a two-story bakehouse at the rear (Mr. H. G. W. Brinsley for Mr. J. A. Taylor).—Agreed.

Deviation from Certified Plans.

St. Pancras, South.—Deviations from the plans certified by the District Surveyor, under Section 43 of the London Building Act, 1894, so far as relates to the proposed rebuilding of the "Globe" public-house, No. 15, London-street, Tottenham Court-road, St. Pancras (Mr. J. G. Ensor for Messrs. Watney, Coombe, Reid, & Co., Limited).—Consent.

Lines of Frontage and Width of Way.

Dulwich.—A house with bay-windows on the north side of Piermont-road, Peckham Rye, to flank upon a footpath next Peckham Rye Park (Mr. W. Stair for Mr. C. W. Chessell).—Consent.

Norwood.—An additional story to a public library building to be erected on the site of Nos. 39 and 41, Westow-hill, Upper Norwood, to abut upon Beardell-street (Mr. E. Haslehurst for the joint committee of the Vestry of Lambeth and the Corporation of Croydon).—Consent.

Norwood.—That the application of Mr. E. Haslehurst for an extension of the periods within which the erection of a public library building on the site of Nos. 39 and 41, Westow-hill, Upper

* Names of applicants are given in brackets. Buildings are new erections unless otherwise stated.

Norwood, to abut upon Beardell-street was required to be commenced and completed, be granted.—Agreed.

Hackney, North.—One-story shops upon part of the forecourts of Nos. 1 to 6 (inclusive), Clissold Park-villas, Church-street, Stoke Newington (Mr. F. Parsons for Mr. J. Jones).—Refused.

St. George, Hanover-square. — Projecting oriel windows, porches, and bay-windows to a proposed building upon the site of Nos. 1 and 2, Grafton-street, St. George, Hanover-square, at the corner of Hay-hill (Messrs. Boehmer & Gibbs).—Refused.

Strand.†—Retention of an inclosed iron and glass porch at the buffet entrance to the Adelphi Hotel, John-street, Strand (Mr. W. Emden).—Refused.

Wandsworth.—Two one-story shops on the south side of Greyhound-lane, Streatham, adjoining No. 102 (Mr. J. Johnson for Mr. J. Piggott).—Refused.

Westminster.†—A one-story addition at the rear of "The White Horse and Bower" public-house, No. 86, Horseferry-road, Westminster, to abut upon Monck-street (Mr. H. W. Budd for the New Westminster Brewery, Company, Limited).—Refused.

Line of Frontage, Width of Way, and Space at Rear.

Strand.—That the Council, in the exercise of its powers under Sections 13 and 22 of the London Building Act, 1894, do not consent to the position and frontage of an addition to Drury-lane Theatre, and of a block of residential flats in connexion therewith with shops on the ground floor on the south-west side of Drury-lane, St. Martin-in-the-Fields, between Russell-street and a proposed diversion of Marquis-court (Mr. P. E. Pilditch for the Theatre Royal, Drury-lane, Limited).—Agreed.

The recommendations marked † are contrary to the views of the Local Authorities.

Correspondence.

To the Editor of THE BUILDER.

NEW VAUXHALL BRIDGE.

SIR,—Your publication of January 7, being chiefly attractive with illustrations and account of Dublin architecture, was not without other interesting illustrations, but it contained one set so unlike the usual exhibits of the *Builder*, in a guise of such vulgar mechanical draughtsmanship, as to induce many architects to throw them aside with distaste. Yet, on turning to these again, there is recognised a design for a very remarkable bridge.

Architecturally I could conceive nothing more hideous, and presented with more complacent ignorance of any sentiment for mere architecture. It is, however, as to the constructional daring of this novel sort of structure that some mere architects would desire some light and leading from engineers who may be above their heads in science.

There is "concrete at 8 to 1," "concrete at 6 to 1," "concrete at 4 to 1," "pivots," "steel rails," "expansion ½-in. joints," &c., distributed in the sections with a confident discrimination that the ignorant, unversed in such cocksure subtlety of construction, would like to have some reason for. Is there any precedent, one would like to know, for employment of homogeneous concrete in such great bulk and spans in the superstructure of a bridge? What is the behaviour to be expected of it with its nicely devised parts of concrete of various admixtures and strength, its "pivots," "steel rails," and "½-in. expansion joints"?

I write in all ignorance of such grand designs, being but a constructor in concrete of small buildings chiefly of domestic importance, but an observer—and with some experience—of the perplexing qualities of expansion and contraction of cement concrete under varying temperatures; even of its irreconcilable actions in parts of the same structure, arising out of differing temperatures of the seasons at which parts had been laid and set.

The architectural student asks me for explanation of the dead knowledge displayed in a curiously-sectioned shore abutment of "4 to 1 concrete." Wherein, he asks, lies the virtue of semicircular arching of sleeper spandrel walls, which would employ about 1½ miles of centreing moulds and a lot of labour, with no relevance to concrete construction? I cannot answer these questions.

Architects at large will deplore that the beautiful river should be outraged with such a feature as this bridge would be—a sham presentment of an impossible stone bridge, with truly "a lie on the face of it," if ever there were one in a design; but interest in the construction lies behind the undeceptive untruth of its exterior all the same. I pigeon-hole the *Builder's* illustration, and pray to live to see this remarkable outcome of triumph of British engineering of the twentieth century realised, and, perhaps, add a tribute of acknowledgment of it. On the other hand, I reserve the right, if I happily survive, to remind the *Builder* of this correspondence, and of the "Faith that lives in honest doubt."

THOMAS DREW, F.R.I.B.A.

Dublin, February 20, 1899.

BRADFORD CENTRAL FIRE BRIGADE STATION COMPETITION.

SIR,—We shall feel obliged if you will allow us to draw the attention of your readers to the most unusual manner in which this competition is being conducted. The sub-committee appointed to make a selection met on Thursday, February 16. The drawings were exhibited to the public on February 17 and 18 in the Free Library, Bradford; no official notice was sent to competitors of this exhibition; it, therefore, appears to us manifestly unfair and unjust that those persons chiefly interested should be kept in ignorance of what is taking place, and be prevented examining the merits of the designs submitted.

Upon a competitor (who by the merest chance happened to discover this state of affairs) asking an official at the public exhibition where the premiated designs were, he took him to the Art Gallery and pointed out the three selected schemes; he pointed out to the official that the first premiated design embraced three distinct schemes, and asked him which of them had been selected by the sub-committee; he thereupon replied, "no single scheme has been selected, but the whole three collectively." How, we would ask, Sir, can three schemes collectively be compared with any one other scheme in a competition?

There are other singular features about the actual selection made, which we think would provoke a great deal of adverse criticism and dissatisfaction in those concerned.

The selection made has not yet been confirmed by the Corporation, and we would, therefore, suggest to other competitors that they at once combine to enter a strong protest against this method of procedure, and endeavour to prevail with the authorities to appoint the professional assessor alluded to in the conditions; a suggestion which under these circumstances they will probably see the wisdom of adopting, and to hold a more extended exhibition of the drawings to enable all competitors to inspect the various designs submitted.

Mr. Ernest E. Fetch (20, John-street, Adelphi) will be happy to receive the names of those who competed, at as early a date as possible.

(Signed)
FORSYTH & MAULE,
H. W. WILLS & JOHN ANDERSON,
G. P. ALLEN & SHIELDS,
BEST & CALLON,
ERNEST E. FETCH,
H. INIGO TRIGGS.

THE THREE-COLOUR PRINTING PROCESS.

SIR,—In the review of the *Magazine of Art*, in your issue of February 11, you refer to the frontispiece, representing a study by Millais for "The Ransom," as "chromo-lithograph." Will you allow me to point out that this description is incorrect? The plate is an example of the new three-colour process, which is, in fact, the main point in connexion with its issue in the magazine. We have wished to show how absolute is the facsimile afforded by this process in its more successful examples, and we have the gratification of knowing that the facsimile is so absolute that it is difficult, apart from close examination, to detect the copy from the original. There are certain qualities of paint which it is practically impossible to reproduce accurately in chromo-lithography. This, I think, is not the case with this process.

THE EDITOR OF THE *Magazine of Art*.

MR. WHALL'S PAPER AT THE ARCHITECTURAL ASSOCIATION.

SIR,—In reading your admirable report of the Architectural Association meeting on Friday, the 3rd inst., I notice that I forgot to answer Mr. Hooper's criticism of the pupils' work at the Central School, to the effect that—

"In some of the drawings before them the leads were so shown that it would be impossible to carry out the design, and he did not think that students should be allowed to work in that unworkmanlike manner."

As this criticism reflects on the efficiency of the school, may I ask for space to point out that it was made under a misapprehension?

Seeing the work from across the room, Mr. Hooper evidently failed to realise that the specimens shown were not all of them designs for complete *leaded lights*, but were most of them patterns made for diapers, "apparels," clasps, jewellery, &c., on robes; for quarries, canopy and such details, which enter so largely into the production of figure work in stained glass. C. W. WHALL.

The Student's Column.

ARCHITECTURAL HYGIENE.

VIII.—DRAIN VENTILATION, INCLUDING SIPHONAGE AND TRAPS.

DRAINS, like human beings, require fresh air in order that they may remain thoroughly clean and harmless. It is here proposed to go shortly into the reasons for this necessity, because, as we shall see, the ventilation of drains is not only necessary in order to keep them wholesome, and for the prevention of standing air, but also to prevent the siphonage of traps and the entrance of sewer gas into the house. These are most important points, and are often ineffectually coped with in old houses. Our next section is "sanitary fittings," and before dealing with these this seems a fitting place to consider the subject of siphonage, as in considering the *fittings* we shall take care to see that the principles enumerated are applied in their construction.

The principal objects to be sought in ventilating drains are, to prevent bad air accumulating, as mentioned above; but if any such does accumulate, to so construct our system that it is immediately led away to the outer air, at such a point as to prevent it being drawn into the house through the windows or other openings.

It is necessary, therefore, to produce throughout the whole system a current of fresh air which shall be continually moving. In order to produce this current we have to think of two natural phenomena. The first of these is the fact that air when heated expands and rises. Now, every drain is laid to a fall, and the vitiated air which naturally accumulates therein, owing to chemical decomposition, is warmer than the atmosphere and its specific gravity is less; it therefore has a tendency to rise to the higher end of the drain. If there is an outlet at this latter end, and an inlet for fresh air at the lower end of the system of drainage, a current is at once produced which, in ordinary circumstances, will be effective in preventing the stagnation of noxious gases.

Another factor which is useful in ventilating drains is the fact that air in motion is lighter and more rarified than air which is at rest; therefore, if a ventilating pipe is carried up well above the ground, if possible to the ridge level of the house, a self-acting exhaust shaft is obtained, because the air at the top end of the pipe is more in motion and less dense than that at the lower end, and hence an upward draught is produced. One system, therefore, which is generally adopted is to have a short inlet pipe at the lower extremity just before the connexion with the main sewer, for the admission of fresh air, and a long outlet pipe at the head of the drain, and off each branch drain (when it carries the drainage from a water-closet or is of any considerable length) carried as mentioned above to such a height that it cannot be a nuisance. The outlet pipe may be either finished with an open end fitted with a galvanised iron wire cage to prevent leaves falling down or birds building in it; or it may be fitted with any of the numerous up-draught cowls, some of which certainly do tend to increase the upward current of air, and many, if they do not effect this, at least prevent a down draught.

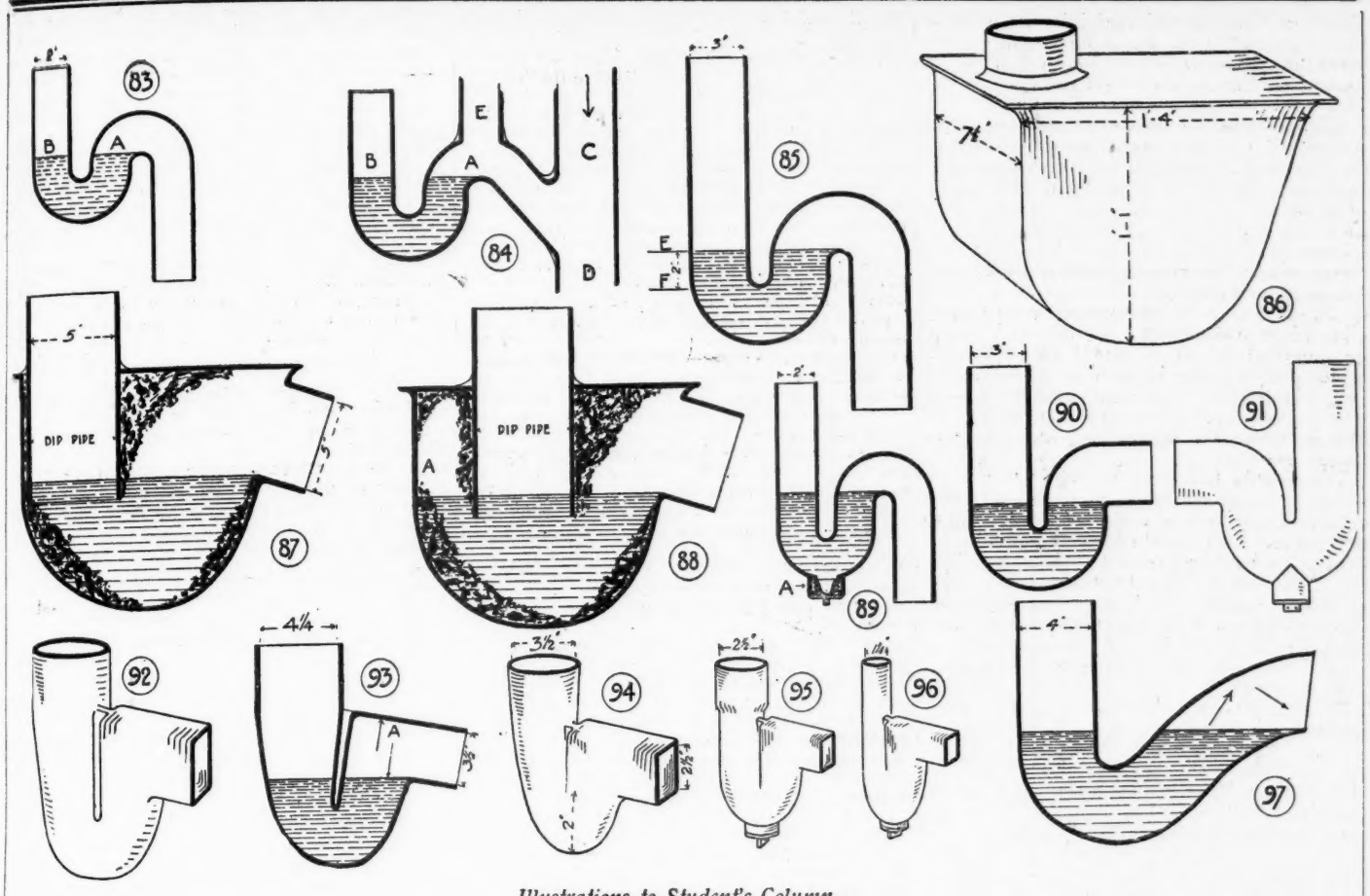
Many architects, however, prefer the open pipe fitted with a wire cage which, as explained, should be an exhaust in itself, under most conditions of the atmosphere.

As to the size of the outlet pipe, it should be of the same diameter as the soil pipe of which it is a continuation.

An outlet pipe which is not a soil pipe should not be less than 4 in. diameter, and should be as far as practicable without any bends in its entire length.

The inlet pipe is usually placed with its opening about 6 ft. from the ground. It is kept as far away as possible from any door or window opening of the house, and is generally fitted with a mica flap valve so placed that it only allows air to enter, any back current of air from the drain causing the valve to shut. This inlet pipe in town houses is taken into the manhole nearest the sewer, by which means the fresh air is admitted into the lower pipes of the drain and can find its way up all the sections of the system.

The inlet pipe should have a sectional area equal to the sum of the various outlets of the main and branch drains in order to be effective.



Illustrations to Student's Column.

Very often a 4 in. inlet pipe is considered sufficient for a large system, whereas a little thought ought to show that it must be perfectly inadequate.

It is important that the inlet and outlet pipes should be made of some material which will not decay, and so clog up the pipe, and in which a perfectly air-tight joint can be made. For this reason it is doubtful whether iron, even when galvanised, should be used, as if there is any defect in the galvanising, rust will form, and eventually collect in the bottom of the pipe and completely choke it up. A case quite recently occurred in a hospital in which the rust had so accumulated as to completely stop the circulation of the air, and the drains had to be opened out to find the defect, when half a pail full of rust chippings were extracted from the bottom of the ventilation pipe. It seems best, therefore, that both inlet and outlet pipes should be made of stout drawn lead pipes of not less than 8 lbs. lead (*i.e.* lead weighing 8 lbs. to the superficial foot). Lead soil or ventilating pipes should be protected up to 6 ft. from the ground by a galvanised sheet-iron shield to protect them from injury.

In country houses, with the inspection-chamber at some distance from the house, the drains are best ventilated by covering the inspection chamber with an open grid, thus admitting as much air as possible (see fig. 59 in a previous article). No air-tight cover is necessary as in towns, where the inspection-chamber is often in a front area, or even in some cases unavoidably placed in the basement itself.

The system described above, although the one usually preferred, yet has its defects, which can now be briefly pointed out.

Under ordinary circumstances, when no discharges are taking place from water-closets or other sanitary fittings, the upward current of air mentioned is not disturbed, but let us consider what takes place when the contents of a water-closet basin are suddenly discharged down a soil or waste-pipe. When this occurs a downward current of air is produced, which upsets all the arrangements of inlet and outlet; that is to say, that during certain times of the day the ventilation system is nullified. Beyond this, it acts in a dangerous way on the whole system, by forcing the air in the pipes downwards, and forcing the bad air through any defects in the fittings of the mica valve of the inlet pipe (which is always liable to be imperfect). If this pipe happens, as is often the case in London, to be near a door or window, the foul air emitted will probably find its way into the house. If the inlet pipe is at a sufficient distance from the house no harm will result.

In this case, therefore, the safest means of ventilation would be to carry both inlet and outlet pipes above the roof level, and, if possible, causing one or other to be more exposed than the other in order to cause an updraught. By placing one on the north side and the other on the south side of the house, the air in the latter, being warmer, would naturally rise and draw the foul air from the whole system. We should also make use of the current of the sewage which would draw the air after it, and would therefore constitute a mechanical power in aid of the system.

Siphonage.—Beyond the necessity of well ventilating drain pipes to keep them clear of foul air, there is another reason which will render it necessary here to make a few remarks on the effect which a sudden discharge from the water-closet or other fitting has on the water seal of traps.

This leads us to the consideration of the mechanical principle of siphonage, which must be thoroughly understood by the student. The siphonage (*i.e.*, the emptying the trap of its water) may occur in two ways, which will be best explained by reference to the fig. 83. This shows an ordinary S trap filled with water. If a discharge of water occurs through the trap itself which is sufficient to fill the sectional area of the pipe, the trap would either remain emptied or a vacuum would be left at the outgo of the trap at A, but nature abhors a vacuum and the pressure of the atmosphere at B being greater than at A, would cause either part or the whole of the water to be forced out of the trap, which would be useless as a preventive for the inlet of foul air; or, in other words, the trap would be *siphoned*.

The water seal of the trap may also be interfered with in another way, such as when two closets are planned one above the other and discharge into the same down pipe C (fig. 84). In this case the air following the discharge down the pipe would also draw the air in the portion AD along with it, thus lessening the pressure on the water in the trap at A, which would cause it to become unsealed by the pressure of the atmosphere at B.

The student can easily satisfy himself on all these points by means of model traps made of glass and joined with glass down pipes by means of indiarubber rings, when the effect can be readily seen.

Both of these causes of unsealing may be prevented by ventilating the trap at its outgo by means of the ventilating pipe E (called the anti-siphonage pipe) which should, in order to be effective, be of the same diameter as A, and should be carried up higher (generally about 6 ft.) than any of the branch pipes AD, when it may be taken into the ventilating pipe CD, which in turn is carried above the roof level. By the introduction of Mr. Hellyer's anti-D traps, described later on, the evils of siphonage were much reduced.

Traps.—The use of traps in a drainage system is imperative, and the principles upon which they should be constructed may be briefly outlined. Earthenware traps placed underground have been already dealt with in a previous article.

A trap in its simplest state is merely a bend in a pipe which retains water and prevents air from passing through it. The illustration (fig. 85) shows a simple S trap, the space between E and F being the water seal. The depth of this seal is important. It should never be less than 1½ in. But a water seal alone is not sufficient to prevent the passage of gas through a trap. The reason of this is that water will absorb such gases and give them off again; for instance, ammonia has been found to pass through the water of a trap in a quarter of an hour. It is necessary, therefore, that the water in a trap should be changed tolerably frequently, and also that the trap itself should be ventilated on its upper side, so that noxious gas may be immediately led away and not press against and saturate the water of the trap. A trap may also be rendered useless by means of evaporation. Ventilation of a trap is required, therefore, in order to secure its efficiency as a trap, as well as for other reasons, which we shall touch on presently.

We give a selection of various types of traps used in the sanitary fittings of a house. Those in the underground drainage have already been discussed under house drainage. They should all be designed so as to be as nearly as possible self-cleansing, to have an effective seal, and to be free as possible from all angles that may retain filth.

Some bad types which do not fulfil these conditions are first given. The "Bell" trap, which was formerly used for scullery sinks, has been already explained, and its defects pointed out in regard to yard drainage. The old D trap was probably one of the worst kinds ever invented, and was so called from its shape. Fig. 86 shows a view of one of these, and gs . 87 and 88 sections of two different kinds.

The "dip" pipe is projected into the water of the trap about 1½ in. In fig. 88 it will be observed that this pipe is some distance from the back of the trap A, where the soil congregates and adheres to the trap. Fig. 87 is a less objectionable section, but even in this form the soil clings to the sides. The trap is full of corners for the collection of filth, as is evidenced by examining any old D trap which is taken out of a house. If the dip-pipe becomes eaten away the trap itself is entirely destroyed.

Some of the better forms of traps are now enumerated. These are generally called after the letter they represent. The S-trap is shown in fig. 89. It is made of stout drawn lead, generally of 8 lbs. to the superficial foot. It will be observed that it is useful for a vertical waste, and is made in sizes of 1¼ in. to 4 in. internal diameter. The smaller kinds are fitted with a screw inspection cap at A as shown, so that in case of stoppage they can easily be cleared out.

The P trap (figs. 90 and 91) is useful for cases in which the waste is horizontal for a certain length, and is constructed similarly to the S trap. Both the P and S traps are largely used to form the traps of baths, sinks, and lavatories. In such cases they are made with an enlarged mouth. This is necessary in order that the trap and waste pipe may be thoroughly flushed out, the full bore of the discharge not being interfered with by the plug and grating from the basin.

These traps are made of the ordinary circular section.

An improvement was, however, made by Mr. Hellyer in introducing his well-known anti-D traps. These were introduced to prevent the water of the trap being driven out by the momentum of the water discharge, and also to secure the thorough scouring of the trap itself. By a series of experiments Mr. Hellyer found that this could be obviated by so shaping the trap that the water-holding portion is contracted and the outgo is larger and square in section. This is useful in preventing siphonage. This square outgo has, however, in some cases been found to collect filth in the angles of the square section. Several illustrations, figs. 92, 93, 94, 95, and 96 show the principles on which these are designed. These traps have a water seal of 1¾ in. The larger size is used for water-closets, and the smaller ones for the wastes of baths, lavatories, and sinks. The smaller ones are generally provided with an "inspection cap" which can be unscrewed in case of stoppage.

It will be observed that the water way of the trap is reduced in size, which increases the scouring of the lower part of the trap and the removal of all refuse, while the outlet, being larger, prevents the pipe filling full bore and causing siphonage. Another advahtage which the anti-D trap has over such a section as fig. 97 (which is a bad form) is that the water rushing through the trap would have a tendency to hit the upper edge of the outlet at fig. 93 and fall back into the trap, instead of being drawn down the waste pipe by the easy outgo, as shown in fig. 97.

In a number of experiments made by Mr. Hellyer the anti-D trap was completely cleaned out with one flush, while the round-pipe traps sometimes required two flushes.

All traps should be ventilated at their outgo if more than one fitting empties into one waste pipe, and even with only one fitting it is best to ventilate it. Some of the experiments made by Mr. Hellyer are interesting as showing the necessity of having the traps ventilated.

GENERAL BUILDING NEWS.

ST. MARK'S CHURCH, BARNET.—The first portion of St. Mark's Church, Barnet, was consecrated recently by the Bishop of St. Albans. The late Mr. J. L Pearson, R.A., was engaged at the commencement of the undertaking, but the work has been carried out under the superintendence of his son, Mr. Frank Pearson. The plan of the church is a parallelogram, about 108 ft. long and 51 ft. wide, divided into a nave, 74 ft. long and 20 ft. 6 in. wide, a chancel, 34 ft. long and the same width as the nave, and with north and south aisles both to the nave and chancel; transepts, 16 ft. wide, and projecting some 10 ft. beyond the aisle wall; vestries, &c., on the north side of the chancel. Flint is used for the walls, with quoins of Little Casterton stone. The windows, doorways, arcades, and all other dressings are also of Little Casterton stone. The main roofs are to be covered with tiles, those of the aisles with lead. The nave is the portion which has been erected. It is divided longitudinally into five bays, with clustered shafts supporting lofty arches The chancel is divided into three bays, which are narrower than those of the nave, and have corresponding pillars and arches. The chancel arch, as designed, partakes of the same character, and rises to a height of 32 ft. The east window will be of seven lights, and the west window of five lights. The end windows of the aisles are of five, and the side windows of nave and chancel are of four and three lights respectively; that of the south transept of four lights. A circular window fills the gable of the north transept; the space below is reserved for the organ. The entrances are in the western bay of the aisles north and south, and are protected by projecting porches. There are no buttresses to the side walls, but the gables have massive buttresses, with terminating pinnacles. The gable ends are diapered with alternate squares of stone and flint. A bell gable for two bells marks the commencement of the chancel. The roofs of nave and chancel are of oak timber. The chancel will have the usual fittings. The floors generally will be tiled with wood-block flooring under the seats or chairs. The walls inside are to be plastered. A tower is contemplated, but this is not comprised in the present undertaking. Mr. E. T. Price was clerk of the works. Messrs. Henry Willcock & Co., of Wolverhampton, are the builders; Mr. Richard Bradford was manager to the contractors.

RE-OPENING OF HOLY SAVIOUR'S CHURCH, TYNEMOUTH.—Tynemouth Church, which has been closed for several months for extensive repairs, was re-opened recently. The church, which was built from the designs of the well-known architect, Dobson, of Newcastle, some sixty years ago, was, until the recent alterations, ceiled with a flat ceiling, with very heavy mouldings of plaster. These had showed ominous cracks in many places for some time past, and last summer, at the request of the vicar and churchwardens, Mr. Hope, of Hope & Maxwell, Newcastle, architects, made an examination of the structure, with the result that the ceiling was reported to be in a dangerous condition, and the roof timbers cracked and strained so much so that he recommended the removal of the entire roof of the nave. It was determined to carry out the whole of the recommendations of the architect. The system of lighting the church with brass pendant gasaliers instead of the old standards has been adopted. A new heating apparatus, whereby the church is warmed by hot water instead of hot air, has been introduced. The contractor for the work was Mr. Miller, Tynemouth; Mr. Green, of Newcastle, was the decorator; Messrs. Dinning & Cooke supplied the hot-water apparatus; and Messrs. Tweddell the plumbing and gasfitting.—*Newcastle Journal.*

ST. FAITH'S CHURCH, WATERLOO, LIVERPOOL.—This building is being erected as a Jubilee gift to the diocese of Liverpool, at the expense of Mr. D. Horsfall. The architects are Messrs. Grayson & Ould. and the contractors are Messrs. Roberts & Robinson, both of Liverpool. The nave will provide sittings for 650 worshippers, and the total sitting accommodation, including choir and transept, will be 800. The material being utilised is red Runcorn stone and red Accrington bricks, with hammer beam roof.

SUNDAY SCHOOLS, BIGGLESWADE.—The new Sunday schools of the Biggleswade Old Meeting were opened recently. The building, which is of white brick relieved by the use of red brick, has been erected in Foundry-lane. The main hall is 40 ft. long by 27 ft. wide, with a height of 20 ft. from the floor to the wall-plate. Eight class-rooms of various sizes open into this hall, and a library and a kitchen have also been provided. The building has been erected by the executors of the late Mr. D. Ruffell, from the plans of Mr. Handley, architect.

PROPOSED HIGHER-GRADE SCHOOL, ABERDEEN.—Plans of a proposed extension of the Central School, Aberdeen, prepared by the School Board's Architect and Master of Works, Mr. J. Ogg Allan, have been approved of Aberdeen School Board, subject to conference with other educational bodies. The plans show a four-story building of light-grey granite, with a frontage to Schoolhill of 120 ft. and a depth of 120 ft., while the height from the street level to the apex of the roof would be 70 ft. The estimated cost is 17,000*l.*

SEDGWICK MEMORIAL MUSEUM.—At a Congregation, held on the 10th instant, of the Senate, Cambridge University, it was resolved to proceed with the plans and designs prepared by Mr. T. G. Jackson, R.A., for the Museum to be erected in memory of the late Dr. A. Sedgwick, F.R.S., who was elected Woodwardian Professor of Geology in 1818. The estimated cost of the Memorial Museum is 36,500*l.*, towards which a sum of about 24,000*l.* has been raised by subscriptions to the memorial fund.

FREE LIBRARY, NEWTOWN, MONTGOMERYSHIRE.—This library will be erected at the corner of Broad-street and Severn-street. It will contain a news-room on the ground floor, with entrance at the corner. On the first floor will be the lending-library and reading-room or reference-library, with librarian's office adjoining. Retiring-rooms for gentlemen are in the basement; for ladies, in a mezzanine floor leading from the first landing. There is also provided a dwelling-house for the librarian. The building will be heated on the low-pressure hot-water system. The walls will be of red brick, with Grinshill stone dressings and oak timber work. The roofs will be covered with Broseley tiles. The corner doorway will be in stone with projecting pediment hood, from which the angle will be corbelled out above, and on which will be sculptured figures of Literature and Progress. Architects were invited to send plans in competition, and those prepared by Mr. Frank H Shayler, of Welshpool and Newtown, were selected

SCOTTISH TEMPERANCE ASSURANCE BUILDINGS, ABERDEEN.—It is proposed to erect in Aberdeen offices for the Scottish Temperance Life and Accident Assurance Company, Limited. The new building will occupy the site of the dwelling-house, 154, Union-street, next to the Royal Bank. The architects are Messrs. Jenkins & Marr, Aberdeen. The building in height will be 70 ft., with a width of 34 ft., and it will have a depth to Diamond-lane of 92 ft. The basement will be occupied with cellars and stores, and on the ground floor there will be two shops, with saloons behind. These shops will be on either side of a central door, giving access to the upper floors. On the first floor there are two sets of offices in the front, and one in the back of the building. On the second floor there is a slightly different arrangement, there being two offices in the front and two at the back. The third floor and attics will be let as a dwelling house. On the level of the third floor there is a laundry and washing-house. The building will be of granite.

MANUFACTURING WORKS, WARRINGTON.—New manufacturing works for Messrs. Fletcher, Russell, & Co., in Wilderspool-road, Warrington, have just been opened. The premises cover an area of twelve and a half acres, and have been erected at a cost of 50,000*l.*, including the purchase of the site. The buildings consist of moulding and passing shops, pressing shop, machine pressing shop, smiths' fitting and machine shops, large warehouse, lowering shop, engine and furnace houses, gas testing department, grinding shop, boiler house, offices, store, and show-rooms. The works have been fitted with the electric light. Mr. Alexander Neil, Vice-Chairman of the Directors, designed the works, it is stated, and they have been architecturally carried out by the Mayor of Warrington (Mr. J. E. Wright), and assistance has been rendered by Mr. William R. Neil. Mr. Davonport was the builder, and Mr. Broadhurst clerk of the works.

BANK, PADDINGTON.—New premises for the National Bank, Limited, have been erected in the Harrow-road. The exterior of the building is of terra-cotta. The building throughout is lighted by electricity, and heated by hot water. The strong-room downstairs is reached by a lift. The architects were Messrs. Edmeston & Gabriel, of London, and the builders, Messrs. Tennant & Co., of Wilesden-green. Messrs. Chubb provided the doors, &c., in the strong-room; the Measham Terra-Cotta Company, the terra-cotta blocks. The opalite walls were by the Opalite Company, of Harrow-road. The asphalte flooring in the basement is by the Val de Travers Company; the lift to the strong-room by Messrs. Waygood & Co.; the electric lighting by Mr. H. M. Leaf; hot water and heating apparatus by Messrs. Jeffries, Queen-street; Messrs. Tickner & Co., Kensal-rise, the wrought-iron railings; and Messrs. Diespeker & Co., the mosaic floor work. The whole of the work has been under the personal supervision of Mr. F. W. Gabriel, one of the architects, with Mr. F. W. Carman as clerk of the works.

STONEHAVEN Corporation Model Lodging-house was formally opened on the 14th inst. The architects were Messrs. J. & J. A. Souttar, Aberdeen.

WESLEYAN SUNDAY SCHOOLS, YORK.—Memorial stones of new Wesleyan Sunday Schools, situate between, and having entrances in, St. Nicholas-street and Milton-street, Hull-road, York, and to be called St. George's Wesleyan Sunday Schools, were laid on the 15th inst. The buildings will consist of four rooms, one 50 ft. by 30 ft., another 30 ft. by 20 ft., and two class-rooms, and they are expected to cost about 1,200*l.* Mr. Edward Taylor is the architect, and Mr. H. E. Turner the builder.

TECHNICAL INSTITUTE, KINGSTON-ON-THAMES.—The new School of Art and Technical Institute erected in the St. James's-road, Kingston, was opened on the 11th inst. The new building is 129 ft. long, and is of red brick, the dressings being of terra-cotta. On the front elevation, facing the Kingston Hall-road, are five gables, two at each end and one in the centre. Each of the two pairs of end gables is surrounded by a shield in terra-cotta, bearing the arms of the borough, quartered with those of the county. The principal entrance is through a door of panelled oak. On the right of the vestibule is the porter's room. To the right hand is the secretary's office, and a doorway close by will lead to the proposed county examination hall. At right angles to the entrance hall is a long corridor, which leads to a dress-cutting room. Next to this is a laboratory or physics class-room. Situated next to this is another class-room, whilst to the left of the corridor is a lavatory, provided with hot and cold water. Leading from the entrance hall is a series of three flights of Portland stone steps, by which access is obtained to the first floor. On the top of the stairs are two wrought-iron grills, ornamented with bronze circular medallions bearing the borough arms. The first room on this floor is intended for the use of the art master. Next to this is situated the clay-modelling room, while in the

centre is the advanced studio, and at the end is the elementary room, 58 ft. 10½ in. by 31 ft. 6 in. The rooms on this floor provide accommodation for 100 students. The building is heated by the low-pressure system, the boiler being in the basement. The architects were Messrs. Lainson & Son, Brighton, and the builders Messrs. Potter Brothers, of Horsham. The electric light has been installed by Messrs. Prestwick & Burt, of Kingston.

PROPOSED NEW WORKHOUSE INFIRMARY, DORKING.—To meet the requirements of the Local Government Board, the Guardians of the Dorking Union some time ago resolved to erect a new workhouse infirmary, and they have provisionally accepted the tender of Mr. G. Cummings, of Betchworth, for carrying out the undertaking at an outlay of 7,366*l.* 16s. The structure will be of a total length of 185 ft. The site chosen is at the rear of the workhouse buildings. The infirmary will be a red brick block, the centre part being carried a story higher than the two side wings. The ground floor will be approached by a vestibule and entrance hall, on the left-hand side of which will be the female wards, bath-rooms, &c. On the right-hand side are shown the male wards and similar offices, and there are also rooms for males and females, and doctor's room, and sculleries. The first floor will be approached by two staircases. Here the wards are divided into two blocks, one for males and the other for females, there being also separate wards for patients of both sexes in acute suffering; each set of wards being provided with its own bath-rooms and sanitary annexes. The second floor is devoted to the nurses' bedrooms, sitting-rooms, bath-room, &c. Altogether there will be accommodation in the infirmary for about sixty patients, and in addition there will be a lying-in ward on the ground floor at the rear of the main building, at each end of which will be a tower, forming the sanitary offices. The largest wards are those on the first floor, which measure 36 ft. by 24 ft., those on the ground floor being about 24 ft. by 24 ft. The premises will be heated by Shorland's Patent Manchester stoves and hot water coils. Mr. Percy Adams, of London, is the architect, and the quantity surveyors are Messrs. F. Bargman & Benison, of Dorking.

SANITARY AND ENGINEERING NEWS.

MUNICIPAL WORK IN NORWICH.—The City Engineer of Norwich, Mr. A. E. Collins, has issued a statement of the principal works carried out by his department during the year ended December 31 last. The works referred to do not include the new sewerage operations, either in the streets, at Trowse, or at the New Mills, nor special works, such as the Technical School, the restoration of the Sessions Court, the repairs to and maintenance of Corporation buildings, bridges, gardens, &c. From the report it appears that during the year 800 superficial yards of new granite sett pavement have been laid, and 554 lineal yards of kerbing have been relaid. Of new wood pavement 1,580 superficial yards have been laid, and of new granite kerbing 660 lineal yards. Of new granite sett channels in surburban roads, principally on hills, 9,235 lineal yards have been laid, 77 iron street gullies, of the City Engineer's pattern, have been laid by the Corporation; these gullies are fitted with cleansing liners and special traps which do not become unsealed when the gullies are cleansed. A large number of similar gullies have been fixed by private persons in private streets. The broken granite used on macadamised roads amounts to 2,640 tons, representing an approximate area of 40,000 yards scarified, coated, and rolled. This gives an average finished thickness of 1⅛ in. of new granite over the surfaces dealt with. Broken flints used 1,894 cubic yards, representing an approximate area of 22,728 yards, coated 3 in. thick and rolled. Road shingle used 1,948 cubic yards, representing an approximate area of 23,376 yards, coated 3 in. thick and rolled. Broken stones from depots 400 loads, representing an area of 4,800 yards, making a total of 90,904 superficial yards. New tar-paved footways have been made to the extent of 4,426 superficial yards. Negotiations having been completed by the Streets Improvement Committee, street widenings have been effected in King-street, Mount Pleasant, and St. Benedict-street. In connexion with the tramway works extensive street widenings and street widening works are in progress. Old paths have been refaced with tar and limestone chippings or iron slag to the extent of 9,647 superficial yards. There have been 470 superficial yards of tar-paved carriageway made, and 835 yards of new concrete footways, while 2,530 superficial yards of flags had been used for re-instating existing footways. Plans for 586 houses and 65 warehouses, &c., were approved, as also were plans for the laying out of six new streets. 431 dwelling-houses were erected during the year, and 45 factories, and the new buildings and other works in progress on December 31, 1898, was 297. Eighty per cent. of the houses erected in 1898 have water closets, and 20 per cent. pan closets. The statement gives details of other works carried out, and Mr. Collins adds that the sample slop water apparatus fixed some three years since at cottages in Lower Westwick-street continues to give entire satisfaction. Notwithstanding a stringent watch, no waste of water has been observed in consequence of its construction, and at no time has it been a nuisance in any way. In every respect the slop water-closet is a very great advance on the pan-closet it replaced; it is much superior to a bin or pan-closet, and in many respects for outdoor closets is preferable to water-closets. The slop water-closet requires absolutely no supply of water whatever beyond the ordinary waste of the household; it is not subject to being put out of action by frost; the concentrated flushes tend to keep the house drains in good working condition.

PROPOSED BRIDGE, COX GREEN, SUNDERLAND.—The Barmston Council have waited on the Durham County Council as to erecting a bridge across the River Wear, at Cox Green, midway between Cox Green and Washington stations on the North-Eastern Railway, the only available means of access at present being by the ferries, which are often dangerous in flood times. The bridge has been designed by Messrs. D. Balfour & Son, of London and Newcastle, and consists of a steel arched bridge, having a span of 150 ft., and, to allow of shipping facilities, a height of 30 ft. above high-water mark is required.

FOREIGN.

FRANCE.—The Government has decided to abandon the Pavillon de Flore at the Louvre, and give it up to the Museum. With the same object, the Marine Museum is to be transported to the Hôtel des Invalides, to leave the space free for pictures.——The plan for the Salons, which will be held, as last year, in the Galerie des Machines, is now made. The ground for the sculpture exhibits will be much as before. For paintings, the Old Salon will have thirty-six rooms instead of thirty. The New Salon will organise some new rooms at the back of the Galerie des Machines on the Avenue Suffren side.——M. Formigé has been commissioned by the Vieux Paris Committee to make further excavation, in the garden of the archbishop's palace in search for traces of the Merovingian fortification wall.——The Société des Artistes Français has addressed to the French Government a demand for the erection of a museum of modern art to take the place of the inadequate galleries at the Luxembourg.——At the Durand Ruel Gallery there is open the sixth exhibition of "Peintres Orientalistes Français," including an interesting collection of the works of Guillaumet; and at the Georges Petit Gallery there is a small exhibition of the works of MM. Besnard, Cazin, Monet, Sisley, and Thaulow.——The jury of the competition opened by the Municipality of Commercey for the construction of a Savings Bank have awarded the first premium to M. Chenevier, of Verdun, and the second to MM. Médard and E. Médard, of the same town.——The "Midi" Railway Company have obtained powers for the construction of several new branch lines, to the extent of 110 kilomètres; among others one from Auch to Lannemez, and one from Biarritz Town to Biarritz.——The death is announced, at the age of fifty-six, of M. Léon de Thorel, member of the Société Centrale des Architectes, a former pupil of the Ecole des Beaux-Arts. He was architect for the restoration of the church of St. Merci and of numerous buildings in Paris, especially a well-known hydropathic establishment—"Le Balneum."——M. Gustave Deloye, the sculptor, has died, at the age of fifty-three. He was a pupil of Jouffroy and Dantan, and obtained a Second Grand Prix de Rome in 1862. All his exhibits at the Salon attracted notice, and he received several important commissions from the State. Among his numerous works may be named the Caryatides of the châteaux of Boissière and Chénonceaux, the busts of Frederic Lemaître, Littré, and Count Andrassy, and more than 200 medallion portraits, among them one of the Princess of Wales. His extreme rapidity of production perhaps rather militated against the higher character of his work, which, however, possessed a great deal of force and individuality.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENT.—Mr. W. Scrivener and Mr. Joseph William Scrivener, of 8, Fitzroy-road, Regent's Park, hitherto in partnership as builders under the firm of "W. Scrivener & Co.," have dissolved partnership by mutual consent. The business will hereafter be conducted by Mr. J. W. Scrivener at the same address.

AUTOMATIC SMOKE PREVENTER.—This is an apparatus specially for boiler furnaces, patented by Messrs. Henry Rossell & Co. (Sheffield). It consists of a series of panels which are opened by the action of opening the furnace door to coal, thus introducing a large supply of air at the proper moment. On the furnace door being closed, the panels are left to close gradually by the action of the cylinder, not stopping the admission of the extra air supply till the black smoke has all burned off. The apparatus is on true scientific principles and ought to answer the aim proposed.

HORNCASTLE STANHOPE MEMORIAL.—An octagonal Gothic structure, 32 ft. in height and 7 ft. in diameter, standing upon a platform of steps, has been lately unveiled in the town of Horncastle. It has been erected by public subscription in memory of the Rt. Hon. Edward Stanhope, M.P., late Secretary of State for the War Department, and contains a bronze medallion likeness. It consists of three stages; the lower one being solid, of Monks Park stone with diaper panels between polished red granite shafts and crocketted pediments above. The middle stage is an open arcading with polished red granite shafts with carved Monks Parks caps and a double set of trefoiled work above, the third stage consisting of a lantern covered with lead, supported by gun-metal shafts and finished by an ornamental finial of the same material. The design was selected in open competition, and is the work of Mr. E. H. Lingen Barker, of London and Hereford, the contractors being Messrs. Walter & Hensman, of Horncastle, and the sculptor Mr. C. J. W. Ladds, of West Keal.

OLD SCARBOROUGH.—It is stated that in pulling down the "Newcastle Packet" inn, on the Sandside, which is supposed to have been originally built more than three hundred years ago, a piece of the old town wall has been discovered, together with a considerable amount of ship's timber, in good state, of which the inn was partly constructed. A neighbouring house is said to be that wherein Richard III. lodged when he visited the town.

WINCHESTER CATHEDRAL.—The Dean of Winchester makes an appeal for contributions towards a sum of about 4,400*l.*, which is still needed to pay for the repairs now completed and for the projected repair of the south aisle roof (estimated at 1,060*l.*), the flat roof of the retro-choir and its aisle (1,065*l.*), and that of the south transept's eastern aisle (435*l.*) The executed repairs (costing in all 11,918*l.* 11s.) include the main roof of the nave, whose stone vaulting was in a dangerous condition, the north transept and its aisles, the choir and its south aisle, and the timber-work of the central tower, carried out by Messrs. Thompson, of Peterborough, under the superintendence of Mr. Colson, of Winchester, with whom Sir J. Wolfe Barry acted as consulting engineer in respect of the nave roofing and the relieving the pressure of the timber upon the vaulting below.

REID'S BREWERY, CLERKENWELL.—Consequently upon the recent amalgamation of three old-established brewery firms, the directors of Messrs. Watney, Combe, Reid, & Co., have decided to dispose of their freehold property on the south side of Clerkenwell-road, formerly Liquorpond-street. The entire property covers an area of 156,500 ft., being just 3½ acres, with side and rear frontages to Leather-lane, Hatton-wall, and Portpool-lane, and includes thirty blocks of brewery buildings, with eight houses and shops. An old plan shows that Reid's (formerly Meux's) brewery in Liquorpond-street was established at the "Old Boar's Head" brewhouse, which, with three adjacent houses in the then Gray's Inn-lane, belonged to the Corporation of Bristol.

PORTLAND CEMENT IN THE UNITED STATES.—The last issue of the *Journal of the Society of Chemical Industry* contains an extract from a paper by R. W. Lesley (Franklin Inst.) upon the history of Portland cement in the United States. The manufacture of natural cement first became established in the States owing to the extending construction of canals, and increased from three million barrels in 1882 to eight and a half million barrels in 1896. Saylon, of Allentown, was the first to make Portland cement in America, shortly after 1870; others followed, and the manufacture is now extensive. American practice differs in some respects from that prevailing in Europe. Dry materials, such as the hydraulic cement, water limestones, and lime rocks of the Lehigh district are ground together to a powder, which is made into bricks by machinery or by hand, and kilned. Mills dealing with marls and clays and wet materials are, however, beginning to run them, directly after mixing, into *bassins de dosage*, such as are used on the Continent, and thence into revolving kilns. The distinctive American kiln is a rotatory kiln, which is an adaptation of that invented by Ransome, but never successfully developed in England. Many works using dry materials are doing well with the dome kilns so often employed in Europe, whilst others prefer the German continuous kilns, with which the consumption of fuel is lower, but the cost of labour higher than with the dome kilns. Others, again, working the Lehigh materials, or marls or clays, introduce the finely ground raw materials (wet or dry) into rotatory kilns, where they at first lose their moisture and carbon dioxide, and are finally delivered in the form of clinkered nodules. This kiln presents the advantage of obviating the necessity of bricking the material. The grinding of the clinker was, quite early in the history of the American industry, accomplished by means of millstones directly driven by belts and encased in iron frames. But since then millstones have been superseded by iron or steel grinding apparatus of the Sturtevant and other types. The Griffin mill, introduced about 1887, is now largely used, as are American Gates crushers and coffee mill crushers. The raw material is obtained chiefly from the laminated lime rocks forming part of the Silurian argillaceous limestones at and around Coplay, on the Lehigh river, near Phillipsburg, New Jersey.

PROPERTY SALES.—A freehold ground-rent of 800*l.* per annum, secured upon St. Magnus House, near the Monument, with reversion in eighty-nine years, has been sold at a price realising almost

twenty-nine years' purchase. It is believed that the block of offices in question marks the site of the house of Farryner, the King's baker, where the Great Fire of London broke out. An inscribed stone—now preserved in the Guildhall Museum—was set (1681) in the front of the house, No. 25, Pudding-lane, erected there after the Fire; the inscription mentions the confession of Robert Hubert who, when under arrest, professed to identify the spot which, as he said, he had been suborned to set in flames. The freehold of Nos. 3-4 Chesterfield-gardens, Mayfair, has lately changed hands for a price but little less than 100,000*l.*

SALE OF ST. LUKE'S, BIRMINGHAM.—The fabric of the condemned Church of St. Luke in Bristol-road has been sold to Mr. Thomas Hancocks, contractor, of Sparkhill, but the transaction is on lines quite different from those which marked the sale of Christ Church. The only points of resemblance are that the purchase value is the same, 5*l.*, and that the fabric is to be taken down, and the material removed. The contractor has undertaken not to make use of the church as either a show or an advertisement hoarding. The Vicar of St. Luke's has retained from the sale the font, bell, clock, mural tablets, communion rail, and the contents (if any) of the cavity beneath the foundation-stone. The contract provides that the work of demolition and clearance shall be completed by the end of May. —*Birmingham Gazette.*

LINCOLN AND THE ELECTRIC LIGHT.—On the 15th inst., Mr. W. O. E. Meade-King, M.I.C.E., Inspector for the Local Government Board, held an inquiry at the Guildhall, Lincoln, relative to an application of the Lincoln Town Council to borrow 19,000*l.* for purposes of electric lighting. Mr. Vesey Brown is the electrical engineer.

WOLVERHAMPTON ELECTRIC LIGHTING.—Mr. George W. Willcocks, M.Inst. C.E., held an inquiry on the 15th inst., at the Town Hall, Wolverhampton, into the application of the Town Council to the Local Government Board for sanction to borrow 29,740*l.* for the purposes of electric lighting. The Town Clerk said the present application was to enable the scheme adopted by the Corporation last October to be carried into effect. Evidence was given by Mr. C. E. Shawfield, electrical engineer, in support of the application. The inspector then visited the generating station in the Commercial-road.

THE DECORATION OF THE ROYAL EXCHANGE.—On the 16th inst., the scheme for filling the panels surrounding the quadrangle of the Royal Exchange with paintings representing scenes of historical interest in the City was carried a further step towards completion by the unveiling of the picture which has been presented to the Gresham Committee by the Sun Fire Insurance Company. The subject of the painting, which is by Mr. Stanhope Forbes, A.R.A,, is the great fire of London. It is a day view of the fire, and depicts the efforts of the occupiers of threatened houses to remove their goods and families from danger by means of river barges.

CHANCEL-SCREEN, PARISH CHURCH, MORTIMER, BERKS.—A chancel-screen has just been erected in the parish church, Mortimer. The screen is of English oak, and was executed by Messrs. Cornish & Gaymer from the design of Sir Arthur Blomfield.

MEMORIAL MONUMENT, CANDIE, GUERNSEY.—A new monument has been recently erected in the Candie Cemetery, Guernsey. The monument is constructed of hard white Carrara marble, and consists, standing upon a pedestal, of a Scriptural figure representing the "Angel of Glory." The figure is surrounded by a marble kerb, while over the greensward a plain cross lies in a reclining position. The work was executed by Messrs. Harry Hems & Sons, of Exeter.

SOUTHAMPTON MASTER BUILDERS' ASSOCIATION.—The annual dinner of the Southampton and District Builders and Decorators' Association was held at the Swiss Café Restaurant, Southampton, on the 15th inst. Major Brinton, ex-President of the Association, presided. The chairman submitted the Royal toast, which, having been duly honoured, Mr. H. N. Jenkins submitted the toast of "The Trade and Commerce of Southampton," coupled with the name of Mr. Peter Stewart, who replied. "The Mayor and Corporation and Borough Officials" was the next toast, and it was proposed by Mr. G. Franklin. The toast was coupled with the names of the Mayor, the Junior Bailiff, and the Borough Engineer, Mr. W. B. G. Bennett. The Mayor and Junior Bailiff Doggrell having replied, the Borough Engineer said that in 1600 there were 400 houses in Southampton, nearly all under the ancient walls. In 1830 there were 4,500 houses, and a population of 19,000. About twenty-five years later there were 14,000 or 15,000 houses, and a population of 57,000, whilst at the present time there were 22,000 houses and a population of over a hundred thousand.—The toast of "The Architectural Profession" was then given by the Vice-President, Mr. H. Cawte, and Messrs. A. F. Gutteridge, W. E. Mitchell, and S. Kelway Pope briefly responded. Mr. Thomas Costigan then proposed the toast of the evening, "Master Builders and Decorators' Association and Kindred Associations." He said that things were transpiring all round which might have serious and far-reaching effects. He could not open his mind to his hearers, nor could he disclose correspondence which he had with him, but whatever might be the result of the present agitation, one lesson must come home to them, and that was that their salvation and very existence depended on combination, because if they were selfish, and did not consider their fellows engaged in the trade, they must eventually be snuffed out of existence. He asked them as men of intelligence and education to realise the great lesson to be learned from combination. Their workmen had shown them what combination meant. If twenty per cent. of the working classes of England were able to exercise such sway and power by trades unions, what would twenty per cent. of the master builders, if combined, be able to do? The working man admired no one more than the man who would stand up and fight for his own and his right. He coupled with the toast the names of Mr. A. T. Doggrell and Mr. S. Minty.—Mr. Doggrell, in reply, gave a brief résumé of the work of the Association during the past year. He referred to what had been done in regard to the Workmen's Compensation Act, and said that after a deal of negotiation and consultation, they as an Association had accepted the terms of the Globe Company, of Manchester, and the majority of the members had insured with that office. The hon. secretary also referred to the fact that there had been several vexatious disputes, in fact, unauthorised strikes, which had not had the sanction of the trades union officials, and he also mentioned the fact that one case had gone to the Higher Court involving an important principle. Mr. S. Minty also briefly responded. Other toasts included "The Visitors" and the "Chairman."

THE DEVELOPMENT OF CENTRAL LEEDS.—Already the Leeds Estates Company have altered the aspect of Briggate, and the present year will witness a further improvement of property in the neighbourhood of that important thoroughfare. The syndicate have just deposited plans, and they have been approved by the Building Clauses Committee of the Corporation, for the development of the north side of Wood-street. The scheme includes the erection of twenty-one shops, with gables and towers, terra-cotta dressings and facings, and granite pilasters, harmonising with the style of architecture adopted in the new buildings on the opposite side of the street. Starting from the centre of the block of property will be a cross arcade, communicating ultimately with two other arcades—one at the end of the Empire Theatre buildings and the other between the north side of Wood-street and the Bay Horse-yard—and connecting in a direct line Briggate and Vicar-lane. The length of the arcade will be 390 ft., and the width 18 ft., and the space above the ground floor will be set back so as to form a gallery on each side. Over forty shops will be provided inside and at the main entrances. The elevation will be of an ornate character, the façade in Briggate being in keeping with the front design of the buildings adjoining the Empire Palace Theatre. In regard to the elevation in Vicar-lane, there will be three towers and three gables, and a series of bays, with terra-cotta dressings and granite and terra-cotta pilasters. The height of the arcade inside will be 35 ft. It is expected that before very long the Building Clauses Committee will be invited to consider plans for the laying out of some of the remaining property acquired by the Estates Company, and that the result of combined private and Corporate enterprise will be a serious effort to form the new thoroughfare running parallel with Wood-street, and thus providing through communication between Albion-street and Vicar-lane and George-street, adjoining Kirkgate Market. This alternative route has been conceived with the object of relieving the traffic along Commercial-street and Kirkgate.—*Yorkshire Post.*

"SELL'S DIRECTORY OF REGISTERED TELEGRAPHIC ADDRESSES."—This directory (published annually, with three quarterly editions) is compiled from official lists supplied by the Post Office, and the issue for 1899 is well up to date. We have previously described the features of this very useful and well-arranged work, with the present issue of which is a map of the Chinese Empire in colours, showing the latest railways and other developments. Amongst the subsidiary contents of the volume will be found special articles on British trade and foreign competition, and a digest of the main features for 1898 of the following industries:—Iron and steel, engineering, shipbuilding and shipping, coal, petroleum, textiles, chemicals, &c.

ABERDEEN CORPORATION TRAMWAYS.—The Town Council has agreed to fit up the Woodside section of the city tramways for electrical traction (overhead trolly system), at a total cost—including the reconstruction of the northmost portion of line—of 33,300*l.*, according to the plans of Mr. J. A. Bell, electrical engineer, and Mr. W. Dyack, C.E., Borough Surveyor, Aberdeen.

HULL STREET IMPROVEMENTS.—A Local Government Board Inquiry was held at the Hull Town Hall on the 16th inst., by Mr. W. O. E. Meade-King, M.Inst.C.E., one of the Local Government Board's Inspectors, regarding the petition of the Hull Corporation to the Board to issue a provisional order to put in force the powers of the Land Clauses Acts with respect to the purchase and taking of lands otherwise than by agreement, with reference to certain lands required by them for the purpose of (1) constructing new streets and widening existing streets between Whitefriargate Bridge and Drypool Bridge (2) constructing a new street continuing Brook-street to Anlaby-road, and (3) widening and improving certain parts of the Anlaby-road, Great Passage-street, Holderness-road, Hessle-road, Clarence-street, and Great Union-street. The scheme was explained in detail by the City Engineer, Mr. A. E. White.

COMMONS PRESERVATION SOCIETY.—A meeting of the executive committee of the Commons Preservation Society was held at 1, Great College-street, Westminster, on Monday, under the presidency of the Right Hon. G. J. Shaw-Lefevre. Amongst others present were Sir Charles Dilke, Sir John T. Brunner, Sir Robert Hunter, the Hon. T. C. Farrer, Mr. Edward North Buxton, and Mr. L. W. Chubb (Secretary). The Honorary Solicitors (Messrs. Horne & Birkett) reported that arrangements had been made with the promoters of the Bexhill and Rotherfield Railway Bill by which the surface of Hazards Green, Ninfield, would be restored, and that no enclosure of the common land affected should take place. The St. David's Water and Gas Company had agreed to limit their interference with Morfa Common, St. David's, to the acquisition of an easement only; it appeared that over forty-two acres of common were within the limits of deviation of the proposed works. Negotiations were pending with the promoters of several other Bills, and it was hoped that they would result in satisfactory arrangements being made for the protection of the public interests. Among these Bills are the Great Eastern Railway (General Powers) Bill, which proposes to absorb 19 acres of Lammas land in the Lea Valley, the Great Western Railway Bill, the Uxbridge and Rickmansworth Railway Bill, under which power is sought to acquire 2 acres of Ickenham Green, a Metropolitan common in Middlesex, 6 acres being within the limits of deviation. At the request of the Society, Sir John Brunner agreed to give notice of opposition to several Bills, including the Omnibus Bill of the London, Brighton, and South Coast Railway, which seeks to absorb two acres of Earlswood Common, a regulated common at Redhill, and the Burley-in-Wharfedale Urban District Water, Horsforth Waterworks and Menstone Waterworks Bills, which propose to acquire in the aggregate over 300 acres of Burley Moor, in Yorkshire. It was also determined to oppose the East London Water Bill and the Bradford Tramways and Improvement Bill. Under the former Bill 194 acres of Chingford, Sewardstone, Broken and Naze Marshes, and Patty Pool Lammas lands, situate in the parishes of Chingford and Waltham Holy Cross, will be absorbed, and it was felt that if the Bill were allowed to pass, the promoters should be pressed to make a considerable addition to Epping Forest, which borders upon the land affected, in exchange for the common land which would be extinguished. The Society was of opinion that the Bradford Tramways and Improvement Bill was open to grave objection in its present form, as it takes power to authorise the sale of 100 acres of Baildon Moor, contrary to the provisions of the Commons Act, 1876. The proposals of the Crown with regard to the New Forest and to the Forest of Dean were also considered, and it was resolved to hold a special meeting to decide what action the Society should take concerning them. It appeared that nearly fifty general cases of interference with common land, roadside waste, rights of way, and open spaces, in all parts of the country, were also receiving the attention of the Society.

NATIONAL REGISTRATION OF PLUMBERS.—The tenth annual meeting of the District Council for Forfar, Perth, and Fife was held at the Town House, Dundee, on Saturday. Mr. Walter M'Gregor presided, and there was a large attendance. The secretary's annual report stated that there were at the present time sixty-nine masters and 153 journeymen upon the register. The classes at the Technical Institute, Dundee, and in Perth, had been well maintained during the year. In the Dundee classes there were forty-five on the roll. It was greatly to be desired that three or four of the journeymen should take the opportunity of joining the class for teachers to be held by the Plumbers' Company at King's College, London, next summer. The meeting then re-elected the retired public representatives on the Council, adding Mr. James Mitchell, organising secretary to the Fife County Council, and substituting Dr. Robertson, Medical Officer of Health for Perth in the room of Dr. Simpson, deceased. The retiring master plumbers' representatives were elected, with the addition of Mr. James Littlejohn, Arbroath. Messrs. Dewar, Fimister, Goldie, and Mackay, were re-elected operative plumber representatives, with the addition of Mr. Hutton. The retiring office bearers were re-elected, viz., President, Lord Provost M'Grady; Vice-Presidents, Ex-Provost Basinghall, Councillor Elliott, Dr. Templeman, and Dr. Lennox; secretary, Mr. J. J. Henderson.

BUILDERS AND THE BY-LAWS CONCERNING SOIL PIPES.—A question of considerable importance to London builders and sanitary engineers has arisen consequent upon applications having been made to the Vestry of St. James, Westminster, for permission to place soil pipes inside instead of outside new buildings. The subject originally arose in connexion with the drainage system of the Carlton Hotel, and at the last meeting of the Vestry the Public Health Committee stated that, in view of such applications, they had had under consideration the desirability of

steps being taken to amend the by-laws made by the London County Council under the Public Health (London) Act, 1891, which provided that the soil pipes shall be placed outside the buildings. Having regard to the fact that no discretionary power is given to the sanitary authority in the matter, the Committee recommended the Vestry to draw the attention of the London County Council to the objections, and to suggest that action should be taken to amend the law, so as to give such discretionary power, and that the London vestries and district boards should be asked to support the views of the Vestry on the subject. A long discussion followed the submission of the recommendation, and in the course of the debate it was stated that the medical officer, Dr. Edmunds, the surveyor, Mr. Monson, and the sanitary inspectors, had expressed the opinion that the by-law on the subject was bad. It was further stated that the bulk of the London Sanitary Authorities honour the by-law by the breach; whilst, on the other hand, it was contended that the by-law should be enforced until it is shown to be defective, and that no evidence on this point has yet been brought forward. It was eventually decided to adjourn for three months the consideration of the recommendation of the Committee, and in the meantime to ask the London County Council whether any complaints have been made as to the working of the by-law; and, if so, whether the County Council think Local Authorities should be given any discretionary power in regard to the matter.

THE TRIANGULAR BRIDGE, CROWLAND.—It is stated that considerable damage has been accidentally done to this structure by a passing vehicle, and that large portions of the masonry are dislodged. The bridge, of which we published a view from a drawing by Mr. Arnold B. Mitchell, on January 26, 1889, spans the confluence of the Nene, the Welland, locally known as the Wash, and the Catwater Drain, in the town near the Abbey. It is supposed to have been originally built by the monks of the Benedictine monastery which Ethelbald, over-lord of Mercia, founded, A.D. 714, in place of Guthlac's hermitage and over his tomb, in the marshes south-east of Deeping Fen. The bridge, whose three pointed arches have, apiece, three moulded stone ribs, and spring from beneath abutments at the angles of an equilateral triangle, is mentioned in a charter, 943, but the present structure—cited by Stukeley as "being too steep to be commonly rode over; horses and carriages go under it"—is generally ascribed to Edward II.'s day. The seated figure, 6 ft. high, seen in the drawing, and vulgarly known as Oliver Cromwell, who was well remembered there, as at Stamford, with a penny loaf, is variously taken to be a statue of Saxon workmanship, of Ethelbald, who sought refuge with Guthlac from Ceolred, or of King Alfred, or his brother Ethelbald II., son of Ethelwulf, *ob.* 860. Other views of the bridge and the statue will be found in vol. i. of John Carter's "Specimens of Ancient Sculpture and Painting, &c.," fo., 1782-6, which also contains drawings, made in 1780, of the statues around the west window, and of the bas-reliefs around the west door, of the Church of SS. Bartholomew and Guthlac, formed out of the Abbey as reinstated by Abbot Jofferhaed in 1112.

ARTISANS', LABOURERS', AND GENERAL DWELLINGS COMPANY.—From the thirty-second annual report of this company we get the statement of the present extent and nature of the house property in hand, and the new works contemplated. At Shaftesbury Park, Battersea, they own 30 shops, 1,135 single houses, 33 double houses (two tenants each), and 1 block of 22 tenements. At Queen's Park, Harrow-road, W., 116 shops, 2,072 single houses, 108 double houses (two tenants each), and a public hall. Four houses have been repurchased during the year. At Noel Park, Wood Green, 85 shops, 1,076 single houses, and 174 double houses (two tenants each), covering altogether about half the area. At Leigham Court, Streatham, 231 houses and 309 maisonettes are let and occupied; besides these, 72 houses and 57 maisonettes are finished or structurally complete, all of which will be ready for occupation during the year. Nineteen shops are structurally complete, 7 of which are let. It is intended during 1899 to build 8 additional houses and proceed with 110 maisonettes, so as to complete Barcombe-avenue; also, on receiving the approval of the London County Council, to lay out the roads on the east side of Hillside-road. The Rev. W. H. Booth, Vicar Designate of St. Margaret's, Leigham Court, is desirous of proceeding with the erection of the nave, aisles, and baptistry of the permanent church. The directors commend to the proprietors Mr. Booth's appeal for assistance for providing the necessary funds.

GLADSTONE BUST FOR OXFORD.—It has been decided that the memorial of the past and present members of the Oxford University Union Society to Mr. Gladstone shall take the form of a bust, to be placed in the Debating Hall. The work has been entrusted to Mr. E. Onslow Ford, R.A.—*Daily Chronicle.*

WHITEHALL IMPROVEMENT.—Mr. Robert Vigers, President of the Surveyors' Institution, who acted as arbitrator in the case of Meynell & Pemberton *v.* The Office of Works, has issued his award. This was a claim by a firm of solicitors for 30,000*l.* as compensation in respect of the leasehold interest in 20, Whitehall-place. The claim as Crown lessor (for ninety-nine years from July, 1820, at a rental of 96*l.* 6s. 9d.) was settled privately for 14,000*l.* The amount awarded by the arbitrator is 3,478*l.*

CAPITAL AND LABOUR.

YORKSHIRE PLASTERERS' WAGES.—The operative plasterers of Spen Valley, Dewsbury, Batley, Morley, &c., have given notice to their employers' representatives of a demand for an advance of 1d. per hour in wages, to take effect on July 1. Their present rate of payment is 8d., and the hours are forty-nine and a half per week.

LEGAL.

THE ACTION AGAINST THE LONDON COUNTY COUNCIL.

THE case of Bayley & Co. *v.* the London County Council, reported in the *Builder* of the 18th inst., was mentioned to Mr. Justice North in the Chancery Division of the High Court of Justice on the 17th inst. It will be remembered that the case came before Mr. Justice Romer (taking motions for Mr. Justice North) on the 11th inst., on a motion by the plaintiffs for an *interim* injunction to restrain the defendants, the London County Council, till the trial, or further order, from trespassing on the plaintiffs' premises, No. 13, Warwick-street, and from interfering with the party wall, &c., and Mr. Justice Romer, after hearing Mr. Henderson in support of the motion, and Mr. Kenyon Parker, for the defendants, granted an *interim* injunction, restraining the defendants over the 17th inst., from interfering with the plaintiffs' premises so as to affect their right to support.

On this day, the 17th inst., it was stated that the evidence was not yet complete, and it was arranged that the case should stand over till the 24th inst., the *interim* injunction granted by Mr. Justice Romer being continued over that day.

IMPORTANT CASE UNDER THE LONDON BUILDING ACT, 1894.

THE case of the London County Council *v.* Dixon which came before a Divisional Court of the Queen's Bench, composed of Justices Lawrance and Channell, on the 15th inst., raised an important question under Sections 7 and 8 of the London Building Act, 1894. The case came before the Court in the form of a special case, stated by the Metropolitan Police Magistrate at Greenwich, from which it appeared that an information was laid against the respondent, Mr. John Dixon, charging him with having, in May, 1898, at Sandhurst-road commenced to form a street for carriage traffic leading out of Sandhurst-road without having obtained the sanction of the County Council, contrary to the London Building Act, 1894. It appears that Sandhurst-road is a new street laid out upon property belonging to a gentleman named Corbett, and in May, 1898, a row of houses had been erected in that road. In that month the respondent commenced the erection of six shops upon land bought from Mr. Corbett, and the shops were erected with a frontage to Sandhurst-road, and upon the same side of it as the row of houses already referred to. A space of 40 ft., as is required by the Act for a carriageway, was left between the last of the houses and the first of the shops, and this space was what was alleged to be the street commenced by the respondent. The shop at the corner has a doorway at the angle, and a shop window and other windows of the house over the shop look into the space. There is also a door opening into the space at a distance of 10 ft. or 12 ft. from the Sandhurst-road, and five coach-houses and stables have been erected at the back of the premises, the only access to which for horses and carriages is by an entrance 80 ft. down the alleged street. This alleged street is the property of Mr. Corbett, and a certain portion of it is used as a cart track communicating with some brick-fields situated at the end of the alleged street, which is about 90 ft. in length. There was no evidence that Mr. Corbett had entered into any agreement with the respondent that the space forming the alleged street should be left open; but this alleged street was marked on the estate plan of Mr. Corbett's estate as "proposed street." Nothing had been done by the respondent to form or lay out the alleged street, except the building of the shops and stables. The requirement of Section 7 of the Act, it was said, was not complied with. This Section enacts that before any person commences to form or lay out any street he shall make an application to the County Council for their sanction to the formation or laying out of such street. Section 8 provides that for the purpose of the part of the Act which includes Section 7, "A person shall be deemed to commence to form or lay out a street if he erect a fence or other boundary, or lay down lines of kerbing, or level the surface of the ground so as to define the course or direction of a street, or . . . if he form or lay out the foundations of a house in such manner and in such position as that such house will or may become one of three or more houses abutting on or erected beside land on which a street is intended to be or may be thereafter laid out or formed. Provided that no person shall be deemed to commence to form or lay out a street, if he do any of the acts in this Section mentioned for some purpose other than that of forming or laying out a street." The magistrate found as a fact that, in the circumstances, a new street for carriage traffic had been commenced to be formed and laid out; but that though the respondent undoubtedly erected the shops in the expectation that the space would be a new street, yet he did not commence to form it, on the ground that he had no control of the roadway of the alleged street. Hence the present appeal by the County Council.

Mr. Horace Avory (with him Mr. Daldy) for the appellants, contended that the person who commenced to form and lay out the street was the respondent. The Act was framed to enable the County Council to take steps to enforce the provisions of the Act before any expense had been incurred by owners or builders, and also framed to catch the builder who built on land adjoining a proposed street, as well as the owner of the roadway.

Mr. R. C. Glen having addressed the Court on behalf of the respondent, their Lordships dismissed the appeal.

Mr. Justice Channell said that the Section was framed in the broadest way, and without the proviso it would include cases which created an absurdity, because any house built upon any land might at some time or other become one of three or more other houses abutting upon land on which a street might at some time be laid out or formed. The proviso, however, saved the Section from this vagueness. In the present case the respondent had obtained his land on such terms that he was entitled to a right of way to his stables; but, knowing that the land over which the right of way passed was likely to become a street, he so built his house as to be suitable in that eventuality.

DISPUTE BETWEEN ELECTRICAL ENGINEER AND ARCHITECT.

A DIVISIONAL COURT of Queen's Bench, composed of Justices Bruce and Ridley, on the 18th inst. delivered judgment in the case of Stegmann *v.* O'Connor, on the plaintiff's appeal from the decision of an official referee, on the ground that the referee's decision was against the weight of evidence. It appeared that the defendant, in 1898, required an electric-light installation put down at his house at Clapham, and his architect prepared the specification. The contract was given to the plaintiff, an electrical engineer, and he proceeded to execute it. During the course of the work, however, a complaint arose that the work was not being done according to the specification, and there was also a complaint that the plaintiff was not finishing the work in the time allowed by the contract, and the defendant's architect then called in another electrical engineer, and the work was completed by him. The plaintiff then brought the present action to recover the amount of his contract, alleging that the work was done according to the specification. The Official Referee, while allowing the plaintiff a certain amount for the actual value of the work taken over by the engineer, awarded the defendant 50*l.* as a penalty for the non-completion of the work by the plaintiff in the time specified by the contract, and entered judgment for the defendant on the claim and counter-claim for 38*l.* 1s. Hence the present appeal by the plaintiff.

Their Lordships now gave judgment, affirming the decision of the Official Referee, and dismissed the appeal with costs.

ST. GEORGE'S (BRISTOL) BY-LAWS CASE.

ON the 10th inst., at the Bristol Police-court, before Messrs. E. B. Colthurst and J. W. Arrowsmith, the case of Yabbicom *v.* King came up for decision. In March, 1898, Edward King, a builder, of Grove Park, Fishponds, was summoned under the Bristol Improvement Acts that in December, 1897, at Glen Park, Bell Hill, St. George, he unlawfully did erect a certain house contrary to the provisions of the Bristol Improvement Acts, 1847, inasmuch as he omitted to build parapets to the said house. The case was adjourned until April 22, and then April 28, and decided by the magistrates on May 10 in defendant's favour. Mr. Wise, who prosecuted, asked to be allowed to state a case, and this was granted; and the appeal came on for hearing on January 13 this year, when the decision of the magistrates was reversed. The chairman of the magistrates explained that the case arose out of an information preferred by the City Surveyor, Mr. Yabbicom, against the defendant, Edward King, under Section 35 of the Bristol Improvement Act, 1847, charging that the defendant unlawfully did erect a certain house contrary to the provisions of the said Act, inasmuch as he omitted to build a parapet to the said house. The case was heard and determined by that court on May 10 last, and upon such hearing it was dismissed. It was then proved that the defendant erected the house in accordance with certain plans approved by the Urban District Council of St. George, prior to such district being included in the city and county of Bristol. It was also proved that such approval

was contrary to the by-laws of the District Council. By Section 15 of the Bristol Corporation Act, 1897, it is enacted "that all plans of new streets, and of new buildings within the added area, approved by the urban district councils or the local authorities respectively, before the commencement of the Act, shall be valid for the period of two years." In dismissing the information the bench came to the conclusion that the defendant had erected the house upon a plan duly deposited and bearing upon it the approval of the District Council, and in so doing they were of opinion that he was legally entitled to do, and that they had no right to inquire into the validity of the approval. The City Surveyor was dissatisfied with their decision, and on his application they stated a case for the opinion of the Divisional Court, and the same came on for argument on January 13 last, the result being that the Court were of opinion that they should have convicted the defendant, and in pursuance of that ruling the magistrates did now convict him; but in view of the whole circumstances of the matter they felt that the justice of the case would be met by the infliction of a fine of 1*l.* and costs. Mr. Wise then made an application with regard to costs. He remarked that Mr. Sibly was allowed 3*l.* in addition to the court fees, and now they were proved to be in the right he asked to be allowed the same amount. Mr. Sibly objected, as the circumstances were very different. Mr. King was pitched upon as a test case, and it would be very hard upon him if he had to pay the costs, and he had hoped that Mr. Wise would not have asked for them. The bench allowed only the court fees and that of one witness.—*Bristol Times and Mirror.*

DISPUTE ABOUT A SMOKE-CURING APPARATUS.

IN the Westminster County Court on Tuesday his Honour Judge Lumley Smith, Q.C., tried the case of Germaines *v.* Kettners, Limited, in which the plaintiff, who is the inventor and patentee of a smoke-preventing apparatus, sued the defendant company, who are the proprietors of a well-known West End restaurant, to recover the sum of fifteen guineas in respect of a patent smoke-preventing apparatus, and also a further charge for fixing.

The plaintiff was called, and said that in January of last year he met the manager of the defendant firm at the office of the Strand District Board of Works, and after some conversation it was agreed that he (plaintiff) should go round to the defendant's restaurant with a view to fixing up one of his patent chimneys. The order was duly given and the work was carried out, but from that day to this he (plaintiff) had been unable to get payment. He had made several applications for payment, but the defendant had put him off with various excuses and finally refused to pay at all. In cross examination, the witness said his invention was intended to reduce the amount of smoke and cure smoky chimneys and he denied that it had the opposite effect by increasing the amount of smoke.

The defendant's manager was called, and admitted having given the order for the apparatus, but said that the effect of it was that there was as much smoke as ever, and that what was far worse was, that a large proportion of it was driven back into the kitchen. The thing was given a fair trial, but it was found to be absolutely useless, and he (witness) had to employ another firm to remove it. It had been lying on the roof ever since, and the plaintiff could have taken it away at any time.

Cross-examined: He denied ever having promised the plaintiff payment, but what he did say was that if it was satisfactory he would get a cheque on the following Wednesday after fixing.

After hearing the evidence of several witnesses as to the uselessness of the apparatus, his Honour said he thought the defendant's order was definite, and did not provide that the thing should be satisfactory. Judgment therefore would be for the plaintiff for fifteen guineas and costs.

CASE UNDER THE WORKMEN'S COMPENSATION ACT.

AT the Clerkenwell County Court on Thursday last week Judge Edge was occupied in hearing an action brought under the Workmen's Compensation Act, 1897. Jane Goulding, Camden Town, claimed compensation from Messrs. Geo. Longden & Son, contractors, Sheffield.

In this action it was stated that the deceased workman was engaged on the defendant's building, Theatre of Varieties, Holloway-road, N., as a scaffolder. On December 24 last he was at work adjusting and readjusting some of the poles of the scaffolding for the purpose of raising material from below to the various heights of the building. He was asked by some of the labourers to change a pole in order that the work might be done more rapidly. He was fixing a pulley at the top of the scaffolding, and while leaning over he fell on an iron girder and died the same night in the Hospital. It was contended that the deceased was not engaged in his proper employment, as he ought not to have interfered with the pulley, and that the defendants, therefore, could not be held liable for the accident.

His Honour, however, gave judgment for the plaintiff for 155*l.* — 75*l.* for the widow, 50*l.* for the younger child, and 30*l.* for the elder one. The case had been taken up by the Union, of which deceased was a member; but his Honour said he should have preferred that an effort had been made to settle the case with the respondents. He therefore made no order as to costs

MEETINGS.

FRIDAY, FEBRUARY 24.

Institution of Civil Engineers (Students' Meeting).—Mr. R. Gordon Mackay on "The Loss of Heat from Buildings." 8 p.m.

SATURDAY, FEBRUARY 25.

Lecture Theatre, South Kensington Museum —Mr. William Burton on "Pottery." I. 3.30 p.m.

Royal Institution.—The Right Hon. Lord Rayleigh on "The Mechanical Properties of Bodies." III. 3 p.m.

Builders' Foremen and Clerks of Works' Institution.—Annual dinner, King's Hall, Holborn Restaurant. 6 p.m.

Sanitary Institute.—Inspection and Demonstration for Sanitary Officers at the Aylesbury Dairy Company's premises, St. Petersburg-place, Bayswater. 3 p.m.

London and Provincial Builders' Foremen's Association.—Monthly Meeting, Memorial Hall, Farringdon-street, E.C. 7.30 p.m.

Edinburgh Architectural Association.—Visit (1) to Milton House Works, Abbeyhill; (2) Holyrood Palace.

MONDAY, FEBRUARY 27.

Royal Academy.—Lectures on Greek Sculpture, by Dr. A. S. Murray. III.—"Victories." 4 p.m.

Carpenters' Hall, London Wall (Free Lectures on Matters connected with Building).—Mr. William Poel on "English Playhouses in the Sixteenth, Seventeenth, and Eighteenth Centuries." With lantern illustrations. 8 p.m.

London Institution.—Professor W. Ramsay on "Recently Discovered Gases of the Atmosphere." Illustrated. 5 p.m

Sanitary Institute (Lectures for Sanitary Officers).—Lecture by Dr. W. A. Bond. 8 p.m.

TUESDAY, FEBRUARY 28.

Northampton Institute, Clerkenwell. — Lectures on Mediæval Architecture, by Mr. Francis Bond. VIII.—"Towers and Spires." 7.45 p.m.

Institution of Civil Engineers.—Mr. W. T. Douglass and Mr. J. A. Purves on "Improvements in Dioptric Apparatus for Lighthouses." 8 p.m.

WEDNESDAY, MARCH 1.

Royal Archæological Institute.—(1) Mr. H. S. Cowper, F.S.A., on "The Influence of the Roman Occupation on the Distribution of Population in Cumberland and Westmoreland." (2) Mr. W. H. Knowles on "An Effigy of a Knight in Warkworth Church, Northumberland." 4 p.m.

British Archæological Association.—The Rev. W. S. Lach-Szyrma, M.A., on "Thoughts on Ancient British Costume." 8 p.m.

Society of Arts.—Mr. Wilton P. Rix on "Leadless Glazes." 8 p.m.

Sanitary Institute (Demonstrations for Sanitary Officers).—Inspection in the Parish of St. George's, Hanover-square. 2 p.m.

Northern Architectural Association.—Mr. J. W. Taylor on "The Bricks used in Northumberland and Durham." 7.30 p.m.

St. Paul's Ecclesiological Society (Chapter House, St. Paul's).—Mr. J. Lewis André, F.S.A., on "The Mural Paintings of Sussex Churches." 7.30 p.m.

THURSDAY, MARCH 2.

Royal Academy.—Lectures on "Greek Sculpture," by Dr. A. S. Murray. IV.—"Bronze Charioteer at Delphi." 4 p.m.

London Institution.—The Rev. Canon Benham on "St. Alban's Abbey." 6 p.m.

Society for the Encouragement of the Fine Arts.—First Conversazione, at the Galleries of the Royal Institute of Painters in Water Colours, Piccadilly. 8.30 p.m.

Sanitary Institute (Lectures for Sanitary Officers).—Professor A. Bostock Hill on "Trade Nuisances." 8 p.m.

Institution of Electrical Engineers.—Mr. G. Marconi on "Wireless Telegraphy." 8 p.m.

Institution of Civil Engineers.—Students' Visit to the works of Messrs. Maudslay, Sons, & Field, Westminster Bridge-road, S.E. 2.30 p.m.

FRIDAY, MARCH 3.

Architectural Association.—Mr. A. Saxon Snell on "Public Baths.' 7.30 p.m.

Glasgow and West of Scotland Technical College (Architectural Craftsmen's Society). — Mr. James M'Kissack on "Half-timber Work." 8 p.m.

Institution of Junior Engineers (Westminster Palace Hotel).—Paper on "Carbon Consuming Batteries and their Possibilities," by Mr. W. R. Cooper, B.Sc., illustrated by experiments. 8 p.m.

Royal Institution.—The Right Hon. Lord Rayleigh on "The Mechanical Properties of Bodies." IV. 3 p.m.

South Kensington Museum (Lecture Theatre).—Mr. William Burton on "Pottery." II. 3.30 p.m.

SATURDAY, MARCH 4.

British Institute of Certified Carpenters.—Visit to the Prudential Assurance Offices at 3 p.m. Mr. H. A. Davey on "Shoring," at 6 p.m., at Carpenters' Hall.

RECENT PATENTS:

ACCEPTED SPECIFICATIONS.

Open to Opposition until April 15.

[1897.]—26,343, Maxim, Filaments for Electrical Lamps. [1898]—533, Hills, and 3,563, Brown, Electrical Arc Lamps. 555, Platt, Apparatus for Soldering, Brazing, Burning off Paint, &c. 3,450, Spence, Treatment of Sewage. 3,668, Stilwell, Soldering Aluminium Joints. 3,916, Furneaux, Windlasses. 4,235, Ham, Valves or Gates for Sewers. 4,282, Byng & Angold, Automatical Cut-outs for Arc Lamps. 5,497, Hoiid, Production of Acetylene Gas. 5,769, Askham, Wilson, & Slack, Grinding, Crushing, Pulverising, and Disintegrating Machines. 5,907, Verver, Domestic Fire-places or Stoves. 6,174, Pollak, Incandescent Light Burners for Liquid Hydro-Carbon. 6,421, Sargents, Means for Rapidly Securing Ropes, Cables, &c. 7,124, Allan & McRobbie, Cleaning Appliances for Incandescent Gas Lamps. 7,199, Tate, Wall Socket and Plug for Electrical Fittings. 7,581, Oliver, Wall Paper, &c. 7,637, Restall, Method of, and Apparatus for, Clearing, Cleaning, Lining and Painting Drain and other Pipes 7,820, Briggs, Crampton, & Edward, Means for Preventing the Accumulation of Soot in Flues and Shafts. 7,877, E. Bailey and Others, White Lead. 8,012, Beardshaw, Drills and their Holders. 8,054, Moores & Farrell, Fixing or Fitting Incandescent Electrical Lamps into Lanterns. 8,229, Carroll, Spanner or Wrench. 8,340, Rhodes & Gaunt, Flushing Cisterns. 8,827, Murat, Roofing. 8,884, Spencer, Spencer, & Smallman, Junctions for Pipes and Tubes. 9,041, Arnold, Sanitary Dustbins. 9,049, Myers, Weighing Apparatus and Computing Scales. 15,322, Burden, Portable Fire-Extinguisher. 17,659, Bergmann, Electricity Meters. 18,221, Sample, Capstans or Winding-Engines. 22,878, Smith, Cowls for Chimneys, Ventilating Shafts, &c. 25,654, Griffin, Incandescent Gas Burners. 25,931, Horton & Bradley, Trusses and Bridges. 26,088, Sutherland, Cements and Plastic Compositions. 26,548, Settle & Padfield, Taps and Cocks. 26,641, Nikles, Combined Adjustable Spanner and Pipe Wrench. 26,720, Karg, Plaited or Basket Work for Use as a Building Material, also in the Construction of Retaining Walls, Revetments, &c. 26,797, Trueman, Means for Closing Junction Inlets or Outlets in Stoneware Pipes when not in use, also Applicable for Joining Pipes. 26,878, Callaway, Moulding Presses. 27,061, Sievert, Sheet Glass. 27,547, Kleine & Stapf, Fire-Proof Concrete Ceilings and Floors. 27,549, Ettles, Roof, Rooflight and Cupola-Light Glazing. 27,628, Hopkins, Apparatus for Preventing the Bursting of Water-Pipes by their Freezing. [1899].—92, Weeks, Hydraulic Jacks. 196, Ree, Apparatus for Use in the Settling and Ornamenting of Ridge Tiles. 574, Pape, Handle-Securing Device.

ABSTRACTS OF PATENTED INVENTIONS.

23,480.—BATH SUPPLY FITTINGS: *H. Schmidt.*—A casing, with an outlet, receives the hot and cold water supply pipes, the supply being regulated by means of ports in a hollow tube which are so spaced that the casing shall take its supply from either or both of the pipes; by a modification the pipes are placed around a central cylindrical plug, and a pipe may be applied, instead of the casing, to the middle port of the tube.

23,492.—BURGLAR-ALARMS: *J. R. Spicer.* — The mechanism of the apparatus (which may be attached to a window, &c., by a removable bracket) is contained in a casing, and consists of a spring clockwork train which operates the hammer of a bell by means of an escapement; the casing has corrugated arms which can be pressed together on a V-spring and be thus inserted into the key-hole; a spring engages an arm on the hammer to keep it normally locked, whilst another spring, controlled by a crank, which is moved if a key is inserted into the key-hole, releases the hammer; the former spring has a lateral stud that projects through the casing for relocking the mechanism.

23,547.—ACETYLENE: *A. Wartenweiler & R. Spengler.* —The descent of a gas-holder supplies water automatically to the generators that hold carbide. The generators are divided into compartments and fitted with covers. For regulating the water supply, a valve has a long arm, to which is attached a cord that supports the balance-weight of the gas-holder. The gas passes to a washer and thence to the holder. When the carbide in one of the first generators is exhausted, the water overflows into the additional generator. A pipe, and a valve which is closed when one half part of the apparatus is being re-charged, connect the additional generators together, and a U-tube, for removal of water is fitted on to the pipe which conveys gas from the holder.

23,559.—DETACHABLE GAS FITTINGS: *J. Findlay.*—The object is to supply gas from a bracket, &c., for both heating and lighting purposes. Instead of the usual light-burner or nipple is devised a fitting which has a lighting burner and an extension for supplying a heating burner, together with either separate cocks for regulating the two supplies, or a four-way cock in the bulb which carries the extension.

23,565.—SOLDERING LAMPS: *M. Eulner.*—The lamp handle carries two tubes whereof one is open at the top, and the other is closed but has an aperture, whilst each contains a wick for saturation with spirit; generation of vapour in the closed tube is produced by igniting the spirit at the other tube's open end, and as the vapour escapes under pressure through the aperture it forms a blow-pipe flame on the wick in the open tube.

23,590.—STOVES AND FIRE-PLACES: *J. E. Russell.*—The register stoves have ornamented side-plates, which are joined by a rail and (at the top) curved plate, the fire-back is canted forward and the flue, transversed by the gases, may be contracted by pushing back a hinged plate; a small door gives access to the chimney, additional heating surface is obtained by means of a chamber formed above, and in front of, the flue, and the bottom of the grate is composed partly of grate-bars and partly of fire-brick.

23,623.—ELECTRICAL LAMPS: *C. Howard & R. Mayer.*—The long neck, to which the bulb is fixed, may be divided and fused or otherwise joined again without injury to the cap, a piece of glass connects two straight wires of platinum or nickel upon which the filament is placed, and the wires are joined to the leading-in wires by tightly-fitting sleeves of thin copper tube or helically coiled wire—or they may be held together by screwed or rivetted blocks, or fixed by tapered pins in oval sleeves; a slotted screw-cap fits against a shoulder on the long neck, and is secured by a band or wire wound around it; the contrivance admits of the ready replacement of a damaged filament.

23,767.—ROOFING TILES: *G. E. Evans.*—The tiles, curved lengthwise and having projections or hanging nibs, are moulded by similarly curved dies, and recesses in the end of the convex die take the plastic material that forms the ribs.

23,771.—WATER-CLOSET FLUSHING AND SIPHON DISCHARGE: *M. J. Adams.*—So that only one ball-cock shall be needed, and the flushing of a series of closets simplified, the cisterns are made to intercommunicate; to enable the flush to rise in the basin before the discharge begins, a weeping-hole is made in the outlet.

23,793.—CARBIDES: *C. J. Lundstrom.*—The carbides are covered, for their preservation, with a material that is for the most part insoluble in water—for example, oil or turpentine, or oil and turpentine together; when they are needed for use they are subjected to heat or to a solution that will decompose the oil or other coating, namely, boric acid solution or soda lye; water mixed with boric acid, soda, &c., will serve to decompose the carbides so coated.

23,807.—ENAMELLED GLASS AND OTHER PLATES, &c., FOR WALLS, CEILINGS, AND PANELLING: *N. E. Geilke.*—The glass, in the form of coloured or uncoloured sheets, is coated with enamel, and, having been fired, presents a marbled, frosted, or crackled opaque appearance; enamelled glass mouldings, or frames embedded in the backing, secure the sheets or panels in position, and the roughened enamel at the panel's back causes it to adhere to the wall; similar mouldings or frames will secure earthenware panels or plates in the same manner.

23,945.—ORNAMENTATION OF WOOD: *A. Wilcke & A. Karpau.*—The surface, polished or varnished, is evenly covered with a non-drying adhesive substance—say, a mixture of yellow wax (1), mutton tallow (1), and raw linseed oil (5)—on to which a thin metal stencil is rolled; plaster of paris or other powder is used to remove the material which is not covered by the stencil, and a mixture of oil of tar or paraffin (1), with fusel oil (5), and wood alcohol (5), is applied to remove the polish or varnish; the wood surface is then cleaned with benzine, and, if need be, coloured; plaster or French chalk will serve to be rubbed on the adhesive material for its removal.

23,993.—ARTIFICIAL STONE, CEMENTS, AND CONCRETES: *C. G. J. Frosell.*—A binding material or cement is composed of burned magnesite or dolomite and magnesium or zinc chloride, mixed together with phosphates, carbonates, and stannates, or other soluble salts, with stannic acid, and with sulpbates of magnesia or other bases. For making artificial sandstone, sand is mixed with the powdered magnesite and stirred about with a solution of magnesium or zinc chloride, the partly stiff mass is treated with a solution of phosphate of soda, &c., and is then hardened, either in air or under water; the cement is described as being capable of resisting heat.

24,017.—COMBINED WRENCH, SCREWDRIVER, AND NAIL EXTRACTOR: *H. A. Burton & L. V. Kennerly.*—The notched and bevelled end of the adjustable wrench serves as a nail extractor, and a screwdriver is fitted on to a handle attached to the cam of the lower jaw. The lower jaw, sliding upon the stem, can be reversed, so that its toothed face can be used for pipes, &c., and its smooth face for nuts. The fixed jaw is toothed, whilst the other jaw has teeth to engage with teeth on the stem by means of the cam.

24,072.—HOT CLOSETS OR OVENS: *J. Keith.*—The closet or oven is heated by hot-water steam radiators, as are described in No. 19,233 of 1894; its ends are formed into one or more radiator sections connected by radiators having shorter columns, or by cross tubes. An outer casing serves to retain the hot air.

24,073.—ELECTRICAL SWITCHES: *F. W. Heaton & H. Smith.*—The connecting arm works on each side of an insulating block, which is fitted between the fixed contacts; a bracket on the block or wall carries a pin on which the handle and its arm work loosely, the handle being shaped so as to force the arm into position against the action of a spring plunger giving a quick break.

24,078.—SLIDE RULES: *R. C. Smith.*—Flexible transparent plates cover the rule's body and slides which are held together by clamps that may slide on the plates and will also serve as an index; to these may be added auxiliary scales, and a rod passing through the sliding clamps may hinge two rules together; the scales themselves can be composed of flexible materials, for use upon curved surfaces.

PRICES CURRENT OF MATERIALS.

TIMBER.		
Greenheart, B.G. ton	8/0/0	0/0/0
Teak, E.I....load	10/10/0	15/10/0
Sequoia, U.S.ft.cu.	1/9/0	2/0/0
Ash, Canada, load	3/17/6	5/5/0
Birch, do.....	3/0/0	5/0/0
Elm, do.....	4/12/6	5/15/0
Fir, Dantsic, &c..	2/0/0	4/0/0
Oak, do.....	3/5/0	3/15/0
Canada	4/0/0	6/0/0
Pine, Canada red.	0/0/0	0/0/0
Do. yellow	4/7/6	6/5/0
Lath, Dantsic, fath	4/10/0	5/10/0
St. Petersburg..	4/0/0	6/10/0
Wainscot, Riga, &c., log.....	3/15/0	5/15/0
Odessa, crown....	3/15/0	5/15/0
Deals, Finland 2nd & 1st std. 100 ..	9/15/0	10/5/0
Do. 4th & 3rd..	9/15/0	10/5/0
Do. Riga	8/5/0	9/5/0
St. Petersburg, 1st yellow....	11/15/0	14/5/0
Do. 2nd yellow.	10/15/0	12/5/0
Do. white.....	9/15/0	11/15/0
Swedish.....	9/15/0	16/15/0
White Sea	10/15/0	18/0/0
Canada, Pine 1st	18/15/0	25/5/0
Do. do. 2nd ..	13/15/0	17/0/0
Do. do. 3rd, &c.	6/0/0	10/0/0
Do. Spruce, 1st..	8/10/0	10/10/0
Do. do. 3rd and 2nd	7/5/0	8/10/0
New Brunswick	7/5/0	8/0/0
Battens all kinds .	5/0/0	16/0/0
Flooring boards, sq., 1 in., prep. 1st	9/6	16/3
Do. 2nd.....	8/0	13/3
Other qualities—	6/3	7/0
Cedar, Cuba, ft...	/4	/4½
Honduras, &c..	/3¾	/4½
Mahogany, Cuba.	/5½	/7
St. Domingo, cargo av.	/5	1/3
Mexican, do. do.	/3¾	/4
Tobasco, do. do.	/4	/6½
Honduras, do...	/4	/6
Box, Turkey, ton.	4/0/0	15/0/0
Rose, Rio.....	7/0/0	14/0/0
Bahia	6/0/0	12/0/0
Satin, St. Doming.	/5	1/0

TIMBER *(continued)*.		
Satin, Porto Rico	0/0/9	0/2/0
Walnut, Italian ..	0/0/3	0/0/7
METALS.		
Iron—Pig, in Scotland .....ton	2/14/6½	0/0/0
Bar, Welsh, in London.....	6/0/0	6/5/0
Do. do. at works in Wales	5/15/0	5/17/6
Do. Staffordshire, in London	6/5/0	7/10/0
COPPER—British cake and ingot	77/10/0	78/0/0
Best selected ..	78/0/0	79/0/0
Sheets, strong..	80/0/0	81/0/0
Chili bars	72/0/0	0/0/0
YELLOW MTL. lb.	7d.	7¼d.
LEAD—Pig		
Spanish ....ton	14/15/0	0/0/0
English com. Brands	15/0/0	0/0/0
Sheet, English 6 lbs. per sq. ft. and upwards ..	16/0/0	0/0/0
Pipe	16/10/0	0/0/0
ZINC—English sheet.....ton	30/0/0	0/0/0
Vieille Montagne	31/0/0	0/0/0
Spelter	27/17/6	28/2/6
TIN—Straits	107/5/0	0/0/0
Australian.....107/15/0		108/5/0
English Ingots.	110/0/0	111/0/0
Banca.....	0/0/0	0/0/0
Billiton	0/0/0	0/0/0
OILS.		
Linseed .....ton	17/10/0	0/0/0
Cocoanut, Cochin	27/15/0	0/0/0
Do. Ceylon	24/10/0	0/0/0
Palm, Lagos.....	21/15/0	0/0/0
Rapeseed, English pale	22/15/0	0/0/0
Do. Brown	21/5/0	0/0/0
Cottonseed ref. ..	15/0/0	16/0/0
Oleine.....	17/0/0	18/0/0
Lubricating U.S.	0/5/3	0/7/6
Do. Black.....	0/5/0	0/6/6
TAR—Stockholm barrel	1/5/0	0/0/0
Archangel.....	0/18/0	0/0/0
Turpentine	32/10/0	0/0/0

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

February 2.—By EDWIN EVANS (at Clapham Junction).

Wandsworth.—69, 71, 85, 87, 89, 93, 95, 97, 101, 102, 103, 104, 106, 110, 111, 112, and 116, Bramfield-rd., u.t. 90 yrs., g.r. 119*l.*, r. 589*l.*... £5,915

9, 11, 49, 53, 55, 57, 61, and 63, Kelmscott-rd., u.t. 90 yrs., g.r. 56*l.*, r. 272*l.* 2,780

24, 28 to 36 (even), and 36a, The Grove, u.t. 94 yrs., g.r. 43*l.*, r. 216*l.* 1,940

By F. MILLER & REID (at Clapham Junction).

Wandsworth.—34b, Earlsfield-rd., u.t. 95 yrs., g.r. 8*l.* 10s., r. 40*l.* 450

62, Westover-rd., u.t. 94 yrs., g.r. 7*l.* 10s., r. 36*l.* 375

By ROBERTS, SON, & TORY (at Wareham).

Wareham, Dorset.—South-st., freehold business premises with warehouses, workshops, &c., area 7,000 ft. £1,850

North-st., Dorset House, u.t. 890 yrs., g.r. 8s. .. 450

February 7.—By WESTON & SONS.

Brixton.—63, Arthur-rd., u.t. 64 yrs., g.r. 5*l.* 5s., r. 32*l.* 360

67, Arthur-rd., u.t. 64 yrs., g.r. 5*l.* 5s., r. 34*l.* .. 380

By ABERCROMBIE & EDMUNDS.

Kilburn.—127, Cambridge-rd., u.t. 66½ yrs., g.r. 8*l.* 400

128, Cambridge-rd., u.t. 75¾ yrs., g.r. 6*l.* 450

By C. H. BROWN.

Wandsworth.—15 and 17, Conroy-st., u.t. 61½ yrs., g.r. 7*l.* 10s. 310

5 and 7, Wilcox-rd., u.t. 33 yrs., g.r. 7*l.* 16s., r. 76*l.* 645

Fulham.—5, Fulham Park-rd., u.t. 79 yrs., g.r. 9*l.*, e.r. 50*l.* 445

Peckham.—185, Peckham Rye, u.t. 34 yrs., g.r. 5*l.*, e.r. 70*l.* 490

By NOTT & CARTWRIGHT.

Notting Hill.—6, Telford-rd., u.t. 69¼ yrs., g.r. 8*l.*, r. 45*l.* 350

Fulham.—58, Townmead-rd., u.t. 96 yrs., g.r. 6*l.* 15s., r. 50*l.* 460

Tooting.—97, 99, 101, and 103, Graveney-rd., u.t. 80 yrs., g.r. 18*l.* 600

By T. B. WESTACOTT.

Caledonian-rd.—No. 223, u.t. 42 yrs., g.r. 8*l.*, r. 48*l.* 465

Holloway.—32 and 33, Ashburton-gr., u.t. 41 yrs., g.r. 8*l.*, r. 55*l.* 450

By PERCY H. CLARKE.

Pimlico.—37, Cumberland-st., u.t. 35 yrs., g.r. 8*l.* 570

Chelsea.—34, Burnaby-st., u.t. 78½ yrs., g.r. 7*l.* 17s. 6d., r. 40*l.* 420

31, 32, 33, and 34, St. Leonard's-ter., u.t. 52½ yrs., g.r. 45*l.*, r. 230*l.* 2,000

Battersea.—32, Park-rd., u.t. 31 yrs., g.r. 5*l.*, r. 30*l.* 290

Fulham.—9 and 11, Goodson-rd., f., r. 65*l.* 740

Chelsea.—31, Glebe-pl., u.t. 42 yrs., g.r. 6*l.*, r. 34*l.* 350

32, Upcerne-rd., u.t. 83 yrs., g.r. 6*l.* 16s. 315

Fulham.—5, Edith-grove, u.t. 27½ yrs., g.r. 5*l.*, r. 45*l.* 470

Wimbledon.—17, 19, 21, and 23, Palmerston-rd., u.t. 73½ yrs., g.r. 20*l.* 640

Clapham.—28, 30, 32, 34, 36, 38, and 40, Abbeyville-rd., u.t. 95½ yrs., g.r. 77*l.*, r. 475*l.* 5,600

By S. & G. KINGSTON (at Spalding).

Whaplode, Lincs.—Park Coates Farm, 99 a. 3 r. 21 p., f. 4,400

By J. J. HILL & WEAVER (at Masons' Hall Tavern).

Holloway.—Hornsey-rd., "The Railway Hotel," u.t. 66½ yrs., r. 100*l.*, with goodwill..... 20,600

By WHETHERLEY & HASLETT (at Masons' Hall Tavern).

Fulham.—Estcourt-rd., "The Redan" b.-h., u.t. 14 yrs., r. 24*l.*, with goodwill..... 11,610

By Messrs. SPELMAN (at Norwich).

Norwich.—160, Queen's-rd., u.t. 52 yrs., g.r. 2*l.* 2s. 6d., r. 16*l.* 240

Aylsham, Norfolk.—Town-lane, six freehold houses and gardens, r. 40*l.* 710

By BOULTON & COOPER (at Malton).

Cawton, Yorks.—The Cawton Estate, 535 a. 3 r. 7 p., f. 11,462

Acklam, Yorks.—A freehold farm, 69 a. 2,145

February 8.—By W. H. BROWN & Co.

Regent-st.—No. 302, Lease for 20½ yrs., r. 280*l.* 1,500

By CHARLES CANEY.

Camberwell.—73, Knatchbull-rd., u.t. 68½ yrs., g.r. 9*l.*, e.r. 55*l.* 500

1, Northway-rd., u.t. 74 yrs., g.r. 5*l.* 10s. 280

Peckham.—2, Firbank-rd., u.t. 70 yrs., g.r. 4*l.* 10s. 300

By BOYCE & EVENS.

Old Ford.—236, Roman-rd., f., r. 35*l.* 730

Dalston.—16, Alvington-cres., u.t. 68 yrs., g.r. 6*l.*, r. 36*l.* 400

Kentish Town.—88 and 90, Carlton-st., u.t. 62 yrs., g.r. 12*l.*, r. 64*l.* 610

By H. J. BROMLEY.

Norwood.—1, Auckland Hill, u.t. 63 yrs., g.r. 10*l.*, e.r. 50*l.* 300

10, Romany-rd., u.t. 71 yrs., g.r. 5*l.* 190

147 and 149, Romany-rd., f., r. 38*l.* 4s. 530

72 and 74, Gipsy Hill, u.t. 24½ yrs., g.r. 14*l.* 10s. 425

By VINCENT S. LEIGH.

Hackney.—54, College-av., f., r. 39*l.* 425

Ball's Pond.—29, Baxter-rd., u.t. 60 yrs., g.r. 5*l.* 5s., e.r. 35*l.* 320

Bethnal Green.—1 to 5, Corwall-pl., u.t. 76 yrs., g.r. 20*l.* 520

By BENNETT, MILLARD, & LLOYD (at Wedmore).

Wedmore, Somerset.—Freehold house and shop, r. 18*l.* 325

A close of pasture, 1a. 2r. 36p., f. 125

Meare, Somerset.—A close of pasture, 11 a. 1 r. 11 p., f. 375

February 9.—By FAREBROTHER, ELLIS, & Co.

Hampstead.—4, Thurlow-rd., u.t. 52¾ yrs., g.r. 10*l.*, r. 85*l.* 950

By HARDS & BRADLY.

Tooting.—Park-rd., Lyncote, f., r. 30*l.* 440

Norwood.—8, 8a, 9, 9a, 10, 10a, and 11, 11a, Fairview-ter., f. 1,850

Greenwich.—13 and 15, Billingsgate-st., f., r. 39*l.* 370

By G. PEARCE & SONS.

Hackney.—3 and 5, Brunswick-st., f., e.r. 70*l.* 900

Hoxton.—86, Bridport-pl., u.t. 33 yrs., g.r. 4*l.* 4s., r. 34*l.* 295

By STIMSON & SONS.

Newington.—163, Newington Butts, f., r. 85*l.* .. 1,920

Kennington.—348, Kennington-rd., f., e.r. 80*l.* .. 1,400

Bermondsey.—331 and 333, Southwark Park-rd., u.t. 19 yrs., g.r. 7*l.* 4s., r. 66*l.* 295

Balham.—11 and 15, Rossiter-rd., u.t. 78 yrs., g.r. 14*l.* 14s., r. 56*l.* 485

Norwood.—12, 14, 16, and 18, Cobden-rd., u.t. 66 yrs., g.r. 16*l.* 16s. 450

Peckham.—20, Fendick-rd., and 83, Graylands-rd., u.t. 66 yrs., g.r. 6*l.* 270

Bow.—7, Balmer-rd., u.t. 74 yrs., g.r. 3*l.* 205

Finchley.—6 and 8, Hamilton-rd., u.t. 80 yrs., g.r. 7*l.* 190

Clapham.—75, Landor-rd., u.t. 69½ yrs., g.r. 7*l.* 5s., r. 36*l.* £350

29 and 31, Willington-rd., u.t. 46½ yrs., g.r. 10*l.*, r. 59*l.* 450

19 to 27, and 51, 52, and 53, Cottage-grove, u.t. 46½ yrs., g.r. 61*l.*, r. 344*l.* 2,510

Poplar.—5, 5a, 7, 9, 11, 13, and 47, Vesey-st., f. .. 2,050

By NEWBON, EDWARDS, & SHEPHARD.

Islington.—Upper-st., f.g.r. 30*l.*, reversion in 27 yrs. 1,600

Camden-passage, "The Druid's Arms" b.-h., f., r. 50*l.* 1,300

10, Noel-st., f., r. 49*l.* 860

42 and 43, Colebrooke-row, f., r. 125*l.* 2,230

8, Oxford-ter., u.t. 353 yrs., g.r. 8*l.*, r. 44*l.* 520

Temple.—2, Mitre-court, f., r. 272*l.* 3,700

Holloway.—11, Brook-rd., u.t. 64 yrs., g.r. 5*l.* 10s., e.r. 35*l.* 305

Stroud Green.—37, Stapleton Hall-rd., u.t. 81 yrs., g.r. 8*l.* 10s., r. 42*l.* 520

Dalston.—10, Stannard-rd., r. 45*l.*; also l.g.r. 6*l.*, u.t. 53 yrs., g.r. 6*l.* 520

Caledonian-rd.—163, 165, and 167, Copenhagen-st., u.t. 41 yrs., g.r. 58*l.*, r. 140*l.* 690

February 10.—By DOLMAN & PEARCE.

Stroud Green.—4, 6, 10, 12, and 14, Mount Pleasant-villas, u.t. 76½ yrs., g.r. 42*l.* 12s., r. 225*l.* 2,130

By J. R. THORNTON.

Ealing.—70 and 72, Ranelagh-rd., f., r. 95*l.* 1,570

February 13.—By ALFRED RICHARDS.

South Tottenham.—156, West Green-rd., f. 1,620

158, 160, 162, and 164, West Green-rd., f., r. 88*l.* 1,560

65 to 73 (odd), Summerhill-rd., f., r. 104*l.* 1,170

Walthamstow.—Hoe-st., two plots of building land, f. 175

By ALFRED SAVILL & SON.

Spitalfields.—36, Dorset-st., and 7 to 12, Little Paternoster-row, u.t. 63½ yrs., g.r. 8*l.*, r. 210*l.* 2,600

Chadwell Heath, Essex.—Romford-rd., a plot of building land, 1 a., f. 570

Romford-rd., Elgin Lodge and 1 a. 1 r. 32 p., f., r. 50*l.* 1,400

By THOMAS MARTIN (at Exeter).

Exeter.—12, Sivell-pl., f., r. 10*l.* 125

23, Mansfield-rd., f., r. 15*l.* 200

7, Smythen-st., f. 150

February 14.—By COCKETT & HENDERSON.

Bethnal Green.—34, Sale-st. and 4, Menotti-st., f. 860

112, 114, and 116, Old Bethnal Green-rd., f. 1,150

By MAPLE & CO.

Barnsbury.—138, Hemingford-rd., u.t. 43½ yrs., g.r. 2*l.*, r. 50*l.* 600

By HAMILTON & MIALL.

Maida Vale.—65, Carlton-vale, u.t. 52½ yrs., g.r. 10*l.*, r. 38*l.* 340

Hoxton.—1 and 3, Whitmore-rd., u.t. 20 yrs., g.r. 4*l.* 0s. 6d., r. 48*l.* 385

Leytonstone.—121, 123, 125, 127, 131, and 133, Colworth-rd., u.t. 98 yrs., g.r. 33*l.*, r. 180*l.* .. 2,018

Brompton.—68, Finborough-rd., u.t. 64 yrs., g.r. 10*l.* 400

Pimlico.—19, Ponsonby-pl., u.t. 26½ yrs., g.r. 6*l.*, r. 44*l.* 345

By ROGERS, CHAPMAN, & THOMAS.

Kennington.—30 and 31, Kempsford-rd., u.t. 28½ yrs., g.r. 12*l.*, r. 68*l.* 530

Clapham.—3, Santley-st., u.t. 76 yrs., g.r. 6*l.* 15s. 375

South Kensington.—64, Redcliffe-gardens, u.t. 67 yrs., g.r. 30*l.* 960

6, 8, and 10, Westgate-ter., u.t. 53½ yrs., g.r. 45*l.*, e.r. 180*l.* 1,265

By DAVID BURNETT & CO.

Croydon.—8 to 18 (even), Dennett's-rd., u.t. 82½ yrs., g.r. 29*l.* 3s. 6d. 670

Tottenham.—28 to 44 (even), Park-lane, u.t. 82 yrs., g.r. 31*l.* 10s. 1,830

Hornsey.—42 to 56 (even), Hampden-rd., u.t. 82½ yrs., g.r. 60*l.* (an undivided 133-707ths share) 300

Brixton.—Barnwell-rd., &c., i.g.r. 253*l.* 4s., u.t. 73 yrs., g.r. 2*l.* (in lots) 5,690

By REYNOLDS & EASON (at Masons' Hall Tavern).

Battersea.—5, Newcomen-rd., f., r. 30*l.* 345

By THOMAS MARTIN (at Exeter).

Exeter.—St. David's Hill, "Beech Hill" and 3¼ a., f. 3,500

February 15.—By FOSTER & CRANFIELD.

City of London.—Monument-st., f.g.r. 800*l.*, reversion in 90 yrs. 23,000

By HENRY HENDRIKS (at Birmingham).

Birmingham.—182 to 189, Ashted-row, f., r. 233*l.* 4s. 3,050

Ashted-row, "The Brewery Inn," f., r. 50*l.* 1,050

60 and 61, Francis-st., f. r. 39*l.* 560

Smethwick, Staffs.—87 to 90, Lightwood's-rd., u.t. 98 yrs., g.r. 14*l.* 925

By J. M. LEEDER & SON (at Neath).

Neath, Glamorgan.—94 to 105. Windsor-rd., f. .. 3,000

104 to 108, Clifton-ter., u.t. 66 yrs., g.r. 7*l.* 14s. 700

82, Britonferry-rd., f., r. 52*l.* 1,200

43, Britonferry-rd., also l.g.r. 15*l.*, u.t. 59½ yrs. g.r. 23*l.* 10s. 950

44 to 52, Crytham-ter., u.t. 59½ yrs., g.r. 13*l.* 10s. 1,125

6, Marshfield-rd., u.t. 59½ yrs., g.r. 1*l.* 10s. 145

Pontardulais, Glamorgan.—Fernhill, u.t. 47½ yrs., g.r. 3*l.*, r. 25*l.* 900

February 16.—By H. J. BLISS & SONS.

Bethnal Green.—138 to 146 (even), Cambridge-rd., f. 2,770

64, Three Colt-lane, beneficial lease for 13 yrs., r. 50*l.*, with goodwill..... 145

Victoria Park.—330, Old Ford-rd., u.t. 55 yrs., g.r. 4*l.*, r. 34*l.* 420

Old Kent-rd.—No. 737, u.t. 12¼ yrs., g.r. 10*l.*, r. 65*l.* 245

Clapton.—26, Pembury-rd., u.t. 45½ and 43 yrs., g.r. nil, e.r. 100*l.* 870

By C. RAWLEY CROSS & CO.

Ealing.—Elmwood-gardens, f.g.r. 87*l.* 3s., reversion in 98 yrs. 2,700

By FIELD & SONS.

Norwood.—Canterbury-grove, the High View Park building estate, 16 a. 1 r. 10 p., f. 14,500

Canterbury-grove, a plot of building land, 2 a. 0 r. 5 p., f. 1,620

Blackfriars.—2, Queen's Arms-court, c. 225

Camberwell.—93, Grove-lane, u.t. 19 yrs., g.r. 30*l.*, renewable for further 99 yrs., fine 30*l.* 500

D'Eynsford-rd., f.g.r. 11*l.*, reversion in 54 yrs... 335

D'Eynsford-rd., f.g. rents 11*l.* 10s., reversion in 58 yrs. 370

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

COMPETITIONS.

Nature of Work.	By whom Advertised.	Premiums.	Designs to be delivered.
*Concert Hall, Reading Room and Lavatories	Ramsgate Corp.	50l.; 20l.; and 10l.	April 30

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Forms of Tender, &c. Supplied by	Tenders to be delivered
*Road Making, &c.	Chingford U.D.C.	W. Stair, The Parade, Chingford	Feb. 27
Four Houses, Butterknowle, co. Durham	.....	W. Perkins, Archt. Bishop Auckland	Feb. 28
Enlargement of Pumping Station, Dalton-street	Birmingham Corp.	E. A. Lees, 44, Broad-st. Birmingham	do.
Four-roomed Houses	Devonport Dockyard Dwellings Co. Ltd.	W. N. Richards, Archt. 29, St. Aubyn-st. Devonport	do.
Superstructure of College	Leeds Sch. Bd.	J. M. Bottomley, Archt. 13, Bond-st. Leeds	do.
Club House, Thurnscoe, near Doncaster	.....	Athron & Beck, Archt. Doncaster	do.
Sewers	Glasgow Corp.	Warren & Stuart, Engr. 115, Wellington-street Glasgow	do.
Additions to Park School	Sheffield Sch. Bd.	C. J. Innocent, Archt. 22, High-st Sheffield	do.
Road Stone	Bridgwater T.C.	Boro Surv. Town Hall	do.
Fire Station	Weston-super-Mare U.D.C.	H. Nettleton, Surv. Town Hall, Weston-super-Mare	do.
Granite Road Metal	Huntingdon R.D.C.	M. Lewin, Surv. Newtown, Huntingdon	do.
Rebuilding Wagon & Horses Inn, Bradford	.....	F. Fielding, Archt. 7, Fountain-st. Halifax	do.
Flints	Walmer (Kent) U.D.C.	F. W. Hardman, 5, Park-st. Deal	do.
*Street Works	Cty. Boro. of West Ham	Lewis Angell, Town Hall, West Ham, E.	do.
*Works and Materials (various)	Lewisham B. of W.	Town Hall, Catford, S.E.	do.
*Road Works, &c. Tyrwhitt-road, Lewisham	do.	Surv.'s Dept. Town Hall, Catford, S.E.	do.
*Road Works, &c. Ringstead-road, Catford	do.	do.	do.
*Drainage Works	Willesden D.C.	O. C. Robson, Public Offices, Dyne-road, Kilburn	do.
*Jobbing and Mason's Work	do.	do.	do.
Three Cottages, Laughaunstown, Killiney	Rathdown Union	C. Draper, C.E. 26 Grosvenor-rd. Rathmines	Mar. 1
Stables, &c. Sandy-lands	Morecambe Omnibus Co.	S. Wright, Surv. Town'ey-st Morecambe	do.
Buildings, Bangor, co. Down	.....	Graeme-Watt & Tulloch, Archt. 77A, Victoria-st. Belfast	do.
Two Houses, Barriper, Camborne	.....	J. S. Pearce, Barriper-rd. Camborne	do.
Waterworks, Pycombe	Cuckfield R.D.C.	J. Johnston, 12, Bond-st Brighton	do.
Twelve Cottages, Londesborough-st. Hull	N. E. Ry. Co.	W. Bell, Archt. York	do.
Warehouse, Brownroyd Brewery, Bradford	.....	Milnes & France, Archts. Bradford	do.
Villa, Cymle-road, Neath	.....	S. C. Jones, Great Western-chambrs Neath	do.
Pair Villas, High Casterton, near Kirkby Lonsdale	J. J. Richardson	J. Kassell, Archt. Kirkby Lonsdale	do.
Underground Convenience	Scarborough T.C.	H. W. Smith, Boro. Engr. Town Hall	do.
Flagging, Paving, &c.	Birkenhead Corp.	C. Brownridge, C.E. Town Hall	do.
*Brick and Pipe Sewers	Leicester Corp.	E. G. Mawbey, Town Hall, Leicester	Mar. 2
Electric Light Station	Bristol Corp.	T. A. Peace, Engr. 19, Queen-sq. Bristol	do.
Business Premises, Bull Green, Halifax	.....	Utley & Co. Archt. 10, Waterhouse-st. Halifax	do.
Sewering, Levelling, &c. Westminster-road	Morecambe U.D.C.	J. Bond, Surv. Council Offices	do.
Footbridge over River Ember	East Molesey U.D.C.	J. Stevenson, Surv. Walton-rd. East Molesey	Mar. 3
Drainage Works	Uxbridge R.D.C.	J. Anstie, C.E. 10, Marchwood-crescent, Ealing	do.
*Drainage Works	Uxbridge R.D.C.	J. Anstie, C.E. 10, Marchwood-crescent, Ealing	do.
*Guernsey Granite	Gravesend T.C.	Borough Surveyor	do.
*Chimney Stack	Edinburgh and Leith Gas Comms.	W. R. Herrig, Gasworks, Edinburgh	Mar. 4
Harbehill Stone (2,310 tons)	Thame R.D.C.	J. Goodenough, Surv. Thame	do.
Street Works, East View	Wakefield Corp.	City Surv. Town Hall	do.
Additions to Schools, King's Lynn	.....	L. F. Eagleton, Archt. Bank-chmbrs. King's Lynn	do.
Granite Road Metal, &c.	Oswestry R.D.C.	C. H. Ball, Council Offices	do.
Alterations to Laundry, Gloucester-road	Littlehampton Steam Laundry Co.	H. Howard, Archt. Town Offices, Littlehampton	do.
Cast Iron Main Pipes	Ashford U.D.C.	Stevenson & Burstal, Engr. 38, Parliament-st. S.W.	do.
*New Gas Works, &c.	Shoeburyness-on-Sea Gas Co. Ltd.	H. J. Robins, 20, Bucklersbury, E.C.	Mar. 6
Street Works, East Back, Nansen-st. &c.	Jarrow U.S.A.	J. Petree, Boro. Surv. Jarrow	do.

CONTRACTS—*Continued.*

Nature of Work or Materials.	By whom Required.	Forms of Tender, &c. Supplied by	Tenders to be delivered
Pair Villas, Rochestown, co. Cork	.....	W. H. Hill & Son, Archt. 28, South Mall, Cork	Mar. 6
Shop, Hipperden, Yorks.	.....	R. Horsfall & Son, Archt. 22A, Commercial-street, Halifax	do.
Six Houses, Low Westwood, Blaydon-on-Tyne	.....	G. T. Wilson, Archt. 121, Durham-rd. Blackhill	do.
Alterations to Infirmary	Bellieborough Union	H. Clarke, Poor Law Office, Bellieborough	do.
*Hospital Buildings	Tiverton Hospital Board	J. Siddals, Tiverton	do.
*Articles and Works	Tottenham U.D.C.	Offices, 712, High-road, Tottenham	Mar. 7
Warehouse, Sowerby Bridge	J. Sykes & Co.	Jackson & Fox, Archts. 7, Rawson-street, Sowerby Bridge	do.
*Road Making	.....	E. Monson, Acton Vale, W.	Mar.
*Works and Materials	Hornsey U.D.C.	E. J. Lovegrove, Offices, Southwood-lane, Highgate, N.	Mar. 9
*Hot Water and Kitchen Fittings	Islington Guardians	W. Smith, 65, Chancery-lane, W.C.	do.
Sewers, Great Eccleston	Garstang (Lancs.) R.D.C.	F. Dixon, C.E. Council Offices	do.
Alterations to White Horse Hotel, Rawtenstall	.....	R. Neill, Archt, 9, Grimshaw-st. Burnley	Mar 13
Electricity Station	Hereford T.C.	J. Parker, C.E. Hereford	do.
Additions to Station, Omagh	G. N. Ry. Co. (Ireland)	T. Morrison, Amiens-st. Terminus, Dublin	do.
Electric Power House, Dublin	do.	do.	do.
*Erection of Coal Stores	Cowes U.D.C.	Engineer, Council Offices	do.
*Men's Conveniences	L.C.C.	Archt's. Dept. 13, Spring-gardens, S.W.	Mar. 14
*Railing, Gates, &c.	do.	do.	do.
School, Bala, Merioneth	.....	H. Teather, Archt. 83, Whyle-cop, Shrewsbury	do.
Granite Flags, C.I. Pipes, &c.	Littleborough (Lancs.) U.D.C.	G. A. Wild, Surv. Council Offices	do.
House, Bridlington Quay	Dr. E. H. Batchelor	Brodrick & Co. Archt. Central-chmbrs. Bridlington Quay	do.
Widening Southgates Bridge, King's Lynn	.....	H. J. Weaver, C.E. Guildhall, King's Lynn	do.
*Fencing	Metropolitan Asylums Board	Treadwell & Martin, 2, Waterloo-place, S.W.	Mar. 15
Well Sinking, Cadoxton, Glam.	Barry U.D.C.	E. W. Waite, C.E. Gas Offices, Barry	do.
Surveyor's Materials	St. Helens (Lancs.) Corp.	G. J. C. Broom, C.E. Town Hall	do.
*Infirmary, &c. at Workhouse	Kingston Union	W. H. Hope, Union Offices, Portsmouth-rd. Kingston-on-Thames	Mar. 23
Additions to Asylum	Ipswich Corp.	E. Buckham, Boro. Surv. Town Hall	April 1
*Granite, Granite Chippings and Dust	Middlesex C.C.	H. T. Workham, Guildhall, Westminster, S.W.	April 4
*Cartage of Granite and Gravel	do.	do.	do
Asylum Buildings, Ranceby, nr. Sleaford	Visitors	G. T. Hine, Archt. 35, Parliament-st. S.W.	do.
*Superstructure of Lunatic Asylum	Kesteven County Asylum	G. T. Hine, 35, Parliament-st. S.W.	do.
Houses, Brown's-square, Belfast	.....	W. J. Moore, Archt. Annst. Belfast	No date
Road Works, Heckington, Sleaford Lines	.....	Hunkinson & Son, Epperstone, Notts.	do.
Three Houses and Shops, Morecambe	.....	J. Hartley, Archt. Morecambe	do.
Schools, Hurst Brook, Ashton-under-Lyne	.....	S. Shirt, Mount Pleasant, Ashton-under-Lyne	do.
Eighteen Cottages, &c. Shipley, Yorks.	.....	J. W. C. Atkinson, Archt. 1, Ivegate, Bradford	do.
Stabling, New Inn, Eccleshill, Yorks	.....	J. Jackson, Archt. Barry-st. Bradford	do.
Bank House, New Deer, Aberdeen	Town and County Bank	R. G. Wilson, Archt. 181A, Union st. Aberdeen	do.
Church, Old Colwyn, N. Wales	.....	Douglas & Minshall, Archts. Chester	do.
Villa, Otley, Yorks.	.....	Fairbank & Wall, Archt. 3, Manor-sq. Otley	do.
Additions to Red Lion Inn, Overton	J. May & Co. Ltd.	R. S. Wallis, Surv. Basingstoke	do.
Additions to Schools, Todmorden	.....	J. Horsfall, Archt. Todmorden	do
Sewering, Paving, &c. Carr and Reed streets	Keighley Corp.	W. H. Hopkinson, C.E. Boro. Engr.	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Application to be in.
*Assistant Surveyor	Acton D.C.	2l. 10s. per week	Feb. 28
*Building Inspector	do.	2l. per week	do.
*Building Inspector	Southend-on-Sea Corp.	125l. per annum	Mar. 3
*Clerk of Works	Cty. Boro. West Ham	4l. 4s. per week	Mar.
*Clerk of Works	Festiniog County Sch.	.....	do.
*City Engineer	Municipality of Calcutta	1,800 Rupees per month	See advt
*Engineering Assistant	Southport Corp.	150l. per annum	No date

Those marked with an asterisk (*) are advertised in this Number. Competitions, p. iv. Contracts, pp. iv. vi. viii. x. & xxi. Public Appointments, pp. xix. & xxi.

Deptford.—22, Strickland-st., u.t. 46 yrs., g.r. 2l. £320

By GREEN & SIMES.

Brixton.—Millbrook-rd., i.g.r. 38l. 10s, u.t. 23 yrs., g.r. 2l. 10s. 480

By MARLER & MARLER.

Notting Hill.—33, Ladbroke-gr., f., r. 100l. 2,000
Chelsea.—1 and 3, Dartrey-rd., u.t. 78 yrs., g.r. 12l., r. 86l. 4s. 780

By MARTIN, CLARKE, & Co.

Highgate.—85, 87, and 89, Dartmouth Park-hill, u.t. 81 yrs., g.r. 15l. 445

By WORSFOLD & HAYWARD (at Dover).

Dover, Kent.—1 and 2, King's-villas, f. 520
87 and 87a, High-st., with blacksmith's forge in rear, f. 1,370
2, Bowling Green-hill, f. 250
2, Union-rd., f. 210
11, 16, and 17, Barton-gardens, f. 1,050
33 and 34, Council House-st., u.t. 85 yrs., g.r. 15l., r. 50l. 470
Priory Hill, Belle Vue, u.t. 67½ yrs., g.r. 3l. 14s., r. 24l. 335

February 17.—By WAGSTAFF & SONS.

Highbury.—9, Gillespie-rd., u.t. 78 yrs., g.r. 6l. 6s., r. 30l. 285

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e.r. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; yd. for yard, &c.

TO CORRESPONDENTS.

O. K.—W. H.—W. P. (Below our limit). J. S.—E. C.—S. & P (Amounts should have been stated).

NOTE.—The responsibility of signed articles, letters, and papers read at public meetings, rests, of course, with the authors.

We cannot undertake to return rejected communications.

Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

We are compelled to decline pointing out books and giving addresses.

Any commission to a contributor to write an article is given subject to the approval of the article, when written, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and *not* to the Editor.

TENDERS.

[Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than* 10 *a.m. on Thursdays*. N.B.—We cannot publish Tenders unless authenticated by the name and address of the sender; and we cannot publish announcements of Tenders accepted unless the amount of the Tender is given, nor any list in which the lowest Tender is under £100, unless in some exceptional cases and for special reasons.]

ASTON MANOR.—For the erection of walls, piers, &c., Upper Witton, for the Urban District Council. Mr. H. Richardson, C. Council House, Aston Manor:—

	With Concrete Coping.	With Brick Coping
Hulbert & Ladbury	£1,268 4 0	£1,301 14 0
Oldfield & Jeacock	1,191 0 0	1,160 0 0
G. Law	1,175 0 0	1,175 0 0
T. Elvins	1,150 0 0	1,130 0 0
W. Hopkins	1,110 0 0	1,120 0 0
Currall & Lewis	1,117 4 2	1,122 8 8
R. Merton Hughes	996 0 0	994 0 0
W. & A. Heaps	967 5 6	967 6 6
G. Trentham	908 7 6	1,099 18 6
E. Garfield, Birchfield-road, Aston Manor (accepted)	905 10 0	917 0

BANBURY.—For additions to public swimming-baths, for the Town Council. Mr. N. H. Dawson, C.E., Town Hall, Banbury—

J. S. Kimberley	£1,478	Orchard & Son, Banbury (accepted)	£1,393

BAKEWELL.—For the erection of an infirmary and additions to workhouse, for the Union Guardians. Mr. E. M. Longsdon, architect, Town Hall, Bakewell. Quantities by the architect:—

T. Allsop & Son	£6,572	Henry Jordan, Horsley Wood House, Derby*	£5,794
Cox, Wilson, & Son	6,381		
Geo. Knowles	6,058		

* Accepted.

BRADFORD.—For the erection of a combing shed and warehouse, Dudley Hill. Mr. F. Holland, architect, 11, Parkinson's Chambers, Hustlergate, Bradford:—

Masonry.—J. Sugden	£261
Joinery.—R. Raper	380
Ironfoundery.—Roberts & Co.	716
Slating.—J. Smithies	173
Plumbing.—W. Pickard	140
Plastering.—A. Taylor	213
Painting.—O. Binns	34

[Revised Tenders.]

CARDIFF.—For the extension of the Higher Grade School, for the School Board. Mr. E. Seward, architect, Queen's-chambers, Queen-street, Cardiff:—

D. Thomas & Co.	£218 10 6	G. Griffiths	£149 16 0
S. Shepton & Sons	190 10 0	C. Price & Sons.	149 0 0
Latty & Co.	179 0 0	W. Thomas & Co.	147 10 0
E. Brown	163 8 6	J. Thomas, 30, Charles-street*	142 0 0
Knox & Wells	161 0 0		
Gough Bros.	156 16 0		

* Accepted.

CRANFORD.—For alterations and additions to the "Berkeley Arms" Hotel, for Mr. L. Hopkins. Mr. J. Hume, architect and surveyor, Chiswick:—

Robinson	£1,470	Keen	£1,430
Smith	1,445	Speechley & Smith*	1,422

* Accepted.

EGHAM.—For erecting a new post-office and private residence, Egham, for Mr. W. H. Gardener:—

W. Beauchamp	£3,030 0	H. Channan	£2,400 0
C. Buckeridge	2,898 0	Loe & Howard	2,350 0
W. Satchwell	2,680 10	G. Gray, Egham*	2,127 0
A. Simpson	2,650 0		

* Accepted

GATESHEAD.—For the erection of a nurses' home, Coatsworth-road:—

M. R. Draper & Son	£2,321 4 7	J. Ross	£1,929 7 3
A. Pringle	2,221 0 0	G. T. Manners	1,896 0 0
T. & R. Lamb	2,068 0 9	Turner Bros.	1,887 0 0
Morrison & McBean	2,053 18 0	J. Wales & Co.	1,850 0 0
Woodall & Wilson	2,042 5 0	J. C. Mather, Gateshead (accepted)	1,797 18 3
H. & B. Arkless	1,938 7 0		

HASTINGS.—For the erection of workhouse buildings, Cackle-street, for the Union Guardians. Messrs. Jeffery & Skiller, architects, 5, Havelock-road, Hastings:—

T. Salter	£50,674	Padgham & Hutchinson	£47,620
J. Lester	49,795	Peter Jenkins, St. Leonards (accepted)	47,500
A. H. White	49,786		

ILKLEY.—For erecting four houses, Richmond-place, Ilkley. Mr. E. Barton Johnson, architect, Ilkley:—

Masonry.—Waugh & Ripley, Skipton-road	£955 0 0
Joinery.—Gill & Pease, Regent-road	459 12 0
Plumbing.—J. Lawson, Brook-street	185 16 0
Plastering.—J. Walsh, Guiseley	129 0 0
Slating.—R. Nelson, Wharfe View	72 10 0
Painting.—J. G. Boden, Wells-road	25 7 6

LEAMINGTON.—For the erection of a refreshment buffet, Jephson-gardens, for the Corporation. Mr. F. Foster, architect, 4, Euston-place, Leamington:—

Dawkes Bros.	£670	C. R. Atkins	£522
G. F. Smith & Sons	610	R. P. Gathercole, Clarendon-avenue (accepted)	470
R. Bowen	579		

LEEDS.—For erecting cottage for Mr. J. W. Reeder, at Lidgett-park, Roundhay, Leeds. Mr. E. Barton Johnson, architect and surveyor, Ilkley:—

Masonry.—Kitchen Bros., Gledhow, near Leeds	£310 6 8
Joinery.—J. Wilson, 177, Woodhouse-street, Leeds	118 6 6
Plumbing.—Carter & Crossland, Lower Headrow, Leeds	36 7 6
Plastering.—T. Moore, Concord-street, Leeds	51 10 0
Slating.—Watson & Worsnop, 25, Whitehall-road, Leeds	34 0 0
Painting.—Roylance & Horsman, St. Mark's road, Leeds	9 16 0

LONDON.—Accepted for new drainage, alterations, and decorations, &c., to 2, Bryanston-place, Bryanston-square, W. Mr. Dennett H. Barry, surveyor, 14, Bell-yard, Temple Bar, W.C.:—
Bartholomew & Co. £375

LONDON.—For alterations and additions to 145 and 147, King-street, Hammersmith, for Messrs. Beckett & Tarvener. Mr. J. Hume, architect and surveyor, Chiswick:—

Pope	£498 10 0	Bendon	£436 10 9
Speechley & Smith	485 0 0	L. L. Leeder	434 7 0

MEXBOROUGH (Yorks).—For sewering, levelling, &c., Helena-street, for the Urban District Council. Mr. G. Fenwick Carter, C.E., District Council Offices, Mexborough:—

Joseph Rothery	£617 10 0
George Eyre, 135, Westerton-road, Crookes, Sheffield*	549 10 6

* Accepted.

NELSON (Lancs.).—For additions, &c., to Zion Baptist Chapel, Elizabeth-street. Mr. H. Whitaker, architect, 21, Market-square, Nelson:—

Cunliffe, Bennet & Brockbank	£567 0	C. Metcalf	£509 10
Matthew Hawley	555 0	A. Robinson, Brierfield, near Burnley*	507 0
S. & W. Dearden	518 15		

* Accepted.

NEWMILNS (N. B.).—For the construction of a storage reservoir, Auchruglin Burn. Mr. P. C. Hart, C.E., 134, St. Vincent-street, Glasgow, and 32, John Finnie-street, Kilmarnock:—

William Simpson, Bonhill, Dumbartonshire	£1,292 15 0
Glenfield Company, Ltd., Kilmarnock (valves, &c.)	82 8 0

PENGE.—Accepted for addition and alterations to 152 and 154, Beckenham-road, Penge, for Mr. Charles Rutter:—
Henry Leney £485

PENGE.—For alteration of premises for the purpose of a Free Library, for the Commissioners for the Hamlet of Penge. Mr. Percival Brown, architect:—

Josoline & Young	£707	Robson	£595
Ellis	642	H. Leney (accepted)	559

PETERBOROUGH.—For the erection of two houses, &c., Vergette-street, for Mr. G. Markham. Mr. Hall, architect, Huntley Grove, Peterborough. Quantities by architect:—

Bailey	£943 11 8	Sibley Bros.	£790 0 0
Guttridge	850 0 0	D. Grey, Cromwell-road*	750 0 0
Hicks Bros.	801 0 0		
Nicholls	795 0 0		

*Accepted.

ROGERSTONE (Mon.).—For the erection of fourteen houses at Rogerstone (Mon.), for Mr. A. Dardis. Messrs. Swalwell & Creighton, architects and surveyors, Dock street, Newport (Mon.) Quantities by the architects:—

	A	B
W. P. Forward	£4,900 0	£5,035 9 4
Newport Gen. Bldrs., Ltd.	4,850 0	5,000 0 0
Powell & Mansfield	4,800 0	5,099 0 0
Newman & James	4,665 12	4,779 12 0
D. Jones	4,562 0	4,781 12 0
D. Lewis	4,500 0	4,769 0 0
W. Sier	4,500 0	4,700 0 0
Thomas & Son	4,500 0	4,680 0 0
C. H. Reed	4,450 0	4,650 0 0
A. S. Morgan & Co.	4,450 0	4,750 0 0
D. J. Davies	4,436 6	4,570 0 0
A. Lawson	4,300 0	4,510 0 0
J. Jenkins	4,180 0	4,343 0 0
J. Moore	4,176 13	4,333 14 0
W. Bambury	3,795 0	3,950 0 0
W. Baglow	3,780 0	3,850 0 0
J. Partridge	3,700 0	3,950 0 0
J. Leadbeater	3,650 0	3,865 0 0
G. Martin & Son	3,577 0	3,695 0 0
J. Pritchard	3,549 0	3,669 0 0
I. Lewis	3,157 0	3,297 0 0
Smith Bros., Newport*	3,070 0	3,220 0 0

*Accepted.

Estimate A faced all round with stock bricks.
Estimate B faced all round with best pressed acing bricks.

SALISBURY.—For the erection of a railway hotel and stables for Messrs. Gibbs, Mew, & Co., Limited. Messrs. John Harding & Son, architects, 58, High-street, Salisbury. Quantities by architects:—

Stephens, Bastow & Co.	£3,998	E. Hale	£2,750
Annett & Son	3,500	Wort & Way	2,690
Jenkins & Sons	3,046	T. Dawkins, Barford-St.-Martin, Salisbury*	2,458
Long & Sons	2,875		
Webb & Co.	2,800		

* Accepted.

SWANSEA.—For the execution of brick and pipe sewerage works, &c., Morriston, for the Urban Sanitary Authority. Mr. W. H. Wyrill, engineer, Guildhall, Swansea:—

Bennett Bros., Swansea*	Hy. Billings
J. & F. Weaver, Swansea†	Griff. Davies
Jno. Williams	Thos. Watkins & Co

* Accepted for Contract No. 25.
† Accepted for Contract No. 26.
[Work tendered for on schedules of prices.]

SWINDON.—Accepted for the erection of "Even Swindon Hotel." Mr. W. H. Read, architect, Corn Exchange, Swindon:—
C. Williams, Swindon £3,065

TWICKENHAM.—For the formation of a new road, St. Margarets, for Mr. H. P. Edwards. Mr. Ernest Pennington, surveyor, Richmond:—

Adamson	£950 0 0	H. Dally*	£765 0 0
Thompson	851 16 7		

* Accepted.

WALLINGFORD.—For the erection of children's quarters, for the Wallingford Board of Guardians. Messrs. Charles Smith & Son, architects, 164, Friar-street, Reading:—

Bartlett Bros.	£3,910 10 0	J. H. Margetts	£3,295 0 0
Wm. Stokes	3,569 0 0	Higgs & Sons	3,250 0 0
Walden & Cox	3,468 16 6	Spear & King	2,975 0 0
T. J. Kingerlee	3,397 0 0	W. Hawkins	2,955 0 0
E. C. Hughes	3,324 0 0	Brashur & Sons, Wallingford*	2,937 0 0
G. H. Tucker	3,300 0 0		

* Accepted subject to the approval of the Loca Government Board

CARDIFF.—For the execution of private improvement works, for the Corporation. Mr. W. Harpur, C.E., Town Hall, Cardiff:—

Streets.	James Rich.	Thos. Rees.	Frank Ashley.	Wm. Ellis.	Chas. Davies.	Eliz. Osmond.
Colwin-place	£181 8 11*	£196 13 9	£222 2 9	£194 9 5	£185 5 11	£186 18 3
Corbett-lane	69 4 6	70 3 6	105 5 0	78 14 7	71 11 0	67 1 2*
Beacon-street	137 13 10*	149 14 6	—	140 10 6	140 14 1	144 11 9
Meadow-street	184 14 5*	200 10 9	—	188 16 4	189 1 2	194 6 11
Bloom-street	160 17 8*	174 13 0	—	167 11 4	164 15 6	168 19 3
Romilly-lane	125 12 1	—	—	127 8 8	125 17 6	115 18 4*
Singleton-road	401 13 5	—	—	393 19 4	387 2 2*	398 12 10
Moorland-road	457 8 1	—	—	445 2 4	430 19 1*	452 19 8
Pontypridd-street	117 16 2	—	—	113 19 8	113 8 5*	117 0 4

* Accepted.

LONDON.—Supply of timber (portion only) for M.T. centres on running contracts, for the London Schoo Board:—

—	E. J. Fitzgerald.	W. H J. R. Hunter.	Illingworth, Ingham & Co.	Ingram Perkins & Co.	J. Latham.	W. Oliver & Sons	E. P. Trenchard & Sons.
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
American Walnut (not less than 9 in. wide):—							
1 in. per ft. super	0 10	0 7	0 6½	0 6	0 6	0 7½	1 0
¾ in. "	0 9	0 5	0 4½	0 4½	0 4½	0 5½	0 11
⅝ in. "	0 8	0 4½	0 3¾	0 3½	0 3½	0 5	0 10
½ in. "	0 7	0 3	0 3	0 3	0 2¾	0 4½	0 9
Cedar:—							
⅝ in. "	0 9	0 3½	0 3½	0 3	0 3	0 4½	0 9
½ in. "	0 8	0 2	0 2½	0 2	0 2½	0 4	0 8

*** Accept tender of J. Latham for American walnut, and tender of Ingram Perkins & Co., for cedar.

LONDON.—Supp'y of the ollowing articles on running contracts:—Modelling Stools; Cupboards—No. 3; Cupboards—Science; Tables—3 ft. 6 in by 2 ft 6 in. (additional contract), for the London School Board:—

Names.	Modelling Stools. Per dozen.	Cupboards, No. 3. Each.	Cupboards, Science. Each.	Tables, 3 ft. 6 in. by 2 ft. 6 in. Each.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.
H. Bouneau	7 0 0	*6 18 6	*8 13 6	—
T. Cruwys	9 18 0	*7 10 0	*8 12 6	1 19 6
Educational Supply Association, Ltd.	9 12 0	—	—	3 12 6
Foster, Cooper, & Foster	5 5 0	11 5 0	12 8 0	2 12 6
J. Garvie & Sons	5 15 0	7 19 4	9 4 3	—
G. M. Hammer & Co., Limited	5 2 0	*7 17 0	9 0 0	*1 14 0
W. H. Lascelles & Co.	5 5 0	9 15 0	*8 13 0	2 2 0
London School Furniture Co.	*5 2 0	—	—	1 17 6
J. H. W. Martin	6 18 0	8 14 0	11 0 0	2 10 0
E. Spencer & Co.	6 3 0	9 10 0	10 0 0	—
T. J. Syer & Co.	—	—	—	2 11 0

* Recommended for acceptance.

LONDON.—Repairs to heating apparatus, on a schedule of prices, on running contracts, for the London School Board:—†

Name.	Group 1.	Group 2.	Group 3.	Group 4.	Group 5.	Group 6.	Group 7	Group 8.	Group 9	Group 10.	Group 11.	Group 12.
	per cent.	per cent.	per cent.	per cent.	per cent.	per cent.	per cent.	per cent.	per cent.	per cent.	per cent.	per cent.
Bates & Pearce	—	+15	—	—	—	—	—	—	—	—	—	—
Z. D. Berry & Sons	+25	+25	+20	+25	+20	+15	+10	+10	+10	+20	+10	+20
G. & E. Bradley	—	+17½	—	+15	+15	—	—	—	—	—	—	—
W. G. Cannon & Sons	+15	+15	+15	+15	+15	+15	+15	+15	+15	+15	+15	+15
Comyn Ching & Co.	—	—	—	—	*At Schedule.	At Schedule.	—	—	—	—	—	—
W. James Cooper	+20	+20	+20	+20	+20	+20	+20	+20	+20	+20	+20	+20
G. Davis	—	—	—	+ 2½	—	*- 2½	*+ 2½	—	—	—	—	—
Duffield & Co	+17½	+17½	+17½	+15	+12½	+10	+12½	+12½	+17½	+20	+20	+20
J. C. & J. S. Ellis, Lim.	+15	+15	+15	+15	+12½	+15	+15	+12½	+15	+15	+15	+15
J. Esson	+22½	+22½	+22½	+22½	+22½	+22½	+22½	+22½	+22½	+22½	+22½	+22½
J. Gray	+27½	+27½	+27½	+27½	+27½	+25	+25	+27½	+27½	+27½	+27½	+27½
J. Grundy	+35	+35	+35	+35	+35	—	+35	+35	+35	+35	+35	—
Lewis Hill	—	+25	—	+25	+25	+25	—	—	—	—	—	—
A. J. Kallaway & Co., Lim.	+10	+10	+10	+10	+10	+10	+10	+10	+10	+10	+10	+10
C. Kite & Co.	—	—	—	+ 5	+ 5	—	—	—	—	—	—	—
T. S. Knight & Sons	—	—	—	*At Schedule.	At Schedule.	At Schedule.	—	—	—	—	—	—
H. C. Price Lea & Co.	—	+15	+15	—	—	—	—	—	—	—	—	—
J. & F. May	—	—	—	—	+60	—	—	—	—	—	—	—
Russell & Co.	+15	+15	+15	+15	+15	+15	+15	+15	+15	+15	+15	+15
Sharp, O'Brien, & Co.	At Schedule.	At Schedule.	*At Schedule.	—	—	—	—	—	—	—	—	—
W. Simmons	+10	—	—	—	—	—	—	—	—	—	—	—
A. H. Skinner & Co.	—	—	+15	—	[omit] +15	+15	+15	—	—	—	—	—
G. W. Tomlinson & Milan, Lim.	—	—	—	—	—	—	—	—	—	—	—	—
Wenham & Waters, Lim.	*- 5	*- 5	- 5	- 5	- 5	- 5	- 5	*- 5	*- 5	*- 5	*- 5	*- 5
J. Wontner-Smith, Gray, & Co.	+15	+10	+10	+10	+10	+15	+15	+15	+15	+15	+20	+20

* Recommended for acceptance. † These contractors have not tendered on the lines laid down by the Board.

WALTHAM ABBEY.—For sewering, making-up, and paving Lee-road, for the Waltham Holy Cross Urban District Council. Mr. C. W. Wiggs, Surveyor :—

Ketteringham	£1,400	W. Gardener	£950
J. Critcher	1,224	Walter Lawrence, Waltham Abbey*	899
E. J. Betts	1,134		
Griffiths	1,110		

* Accepted.

WALTHAM CROSS.—For the erection and completion of stables and offices for the Coal Co-operative Society, Limited. Mr. W. Richards, architect :—

Matthews & Son	£1,009 9 6	Walter Lawrence, Waltham Abbey*	£895 0 0
W. Gardener	950 0 0		
J. Bentley	898 0 0		

* Accepted.

WALTHAM CROSS.—Accepted for the erection of a boiler house for the Waltham Abbey and Cheshunt Gas Company :—
Walter Lawrence, Waltham Abbey £287

WIMBLEDON.—For the erection of an isolation hospital, Gap-road, for the Urban District Council. Mr. C. H. Cooper, C.E., Council offices, Broadway, Wimbledon :—

Tonge	£25,292	Speechley & Smith	£22,100
Minter	23,534	Chessum	21,521
Lorden	23,333	Garratt	21,489
Godson	22,612	Bulled & Co., Croydon*	20,197
Pattinson	22,326	Gough	19,964
General Builders, Ltd.	22,179		

* Accepted.

WIMBLEDON.—For new depot, Haydon's-road, Wimbledon, for Messrs. Eastwood & Co. Mr. O. Maxwell Ayrton, architect :—

Parson & Co.	£1,560	Holdstock & Mould	£1,278
F. G. Minter, Westminster*	1,469		

* Accepted.

LONDON SCHOOL BOARD TENDERS.

At the last meeting of the London School Board, the Works Committee submitted the following lists of tenders :—

BROWNHILL-ROAD SITE.—Removing three temporary iron buildings, &c., from the Lee-street site and re-erecting them upon this site :—

T. Cruwys	£1,450 0 0	J. Mitson & Co.	£1,221 0 0
Humphreys, Ltd.	1,348 0 0	J. & W. T. Hunter	1,150 0 0
W. Harbrow	1,320 0 0	T. J. Hawkins & Co., Ashford, Middlesex*	1,092 7 6
Croggon & Co.	1,250 0 0		

CRANBROOK-ROAD.—Improvements—Halls or boys, girls and infants ; infants' teachers' room on arches ; re-arranging stepping and lighting to centre class-rooms ; providing stock-rooms for all departments. Revised accommodation :—Boys, 464 ; girls, 464 ; infants, 574 ; total, 1,502. (Rooms interfered with placed on seat basis) :—

J. Chessum & Sons	£6,010	F. & F. J. Wood	£5,670
McCormick & Sons	5,828	E. Lawrance & Sons	5,338
W. Shurmur	5,733	Willmott & Sons	5,200
J. Grover & Son	5,695	C. Cox*	5,189

HEBER-ROAD.—Erecting manual training centre (on arches) for forty boys, and drawing class-room :—

Kirk & Randall	£2,984	F. & H. F. Higgs	£2,799
A. White & Co.	2,935	J. Garrett & Son	2,782
W. J. Mitchell & Sons	2,930	J. & C. Bowyer	2,693
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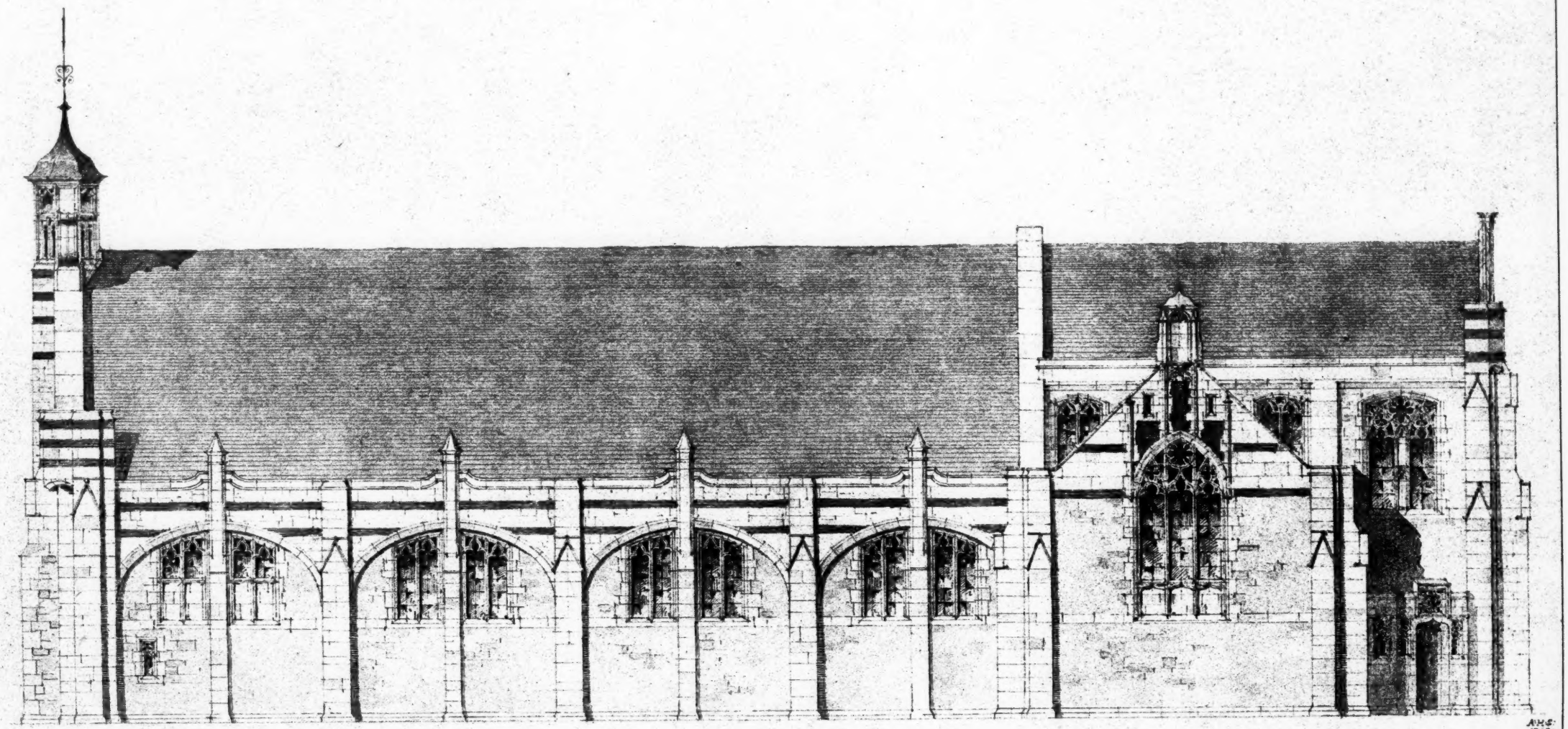

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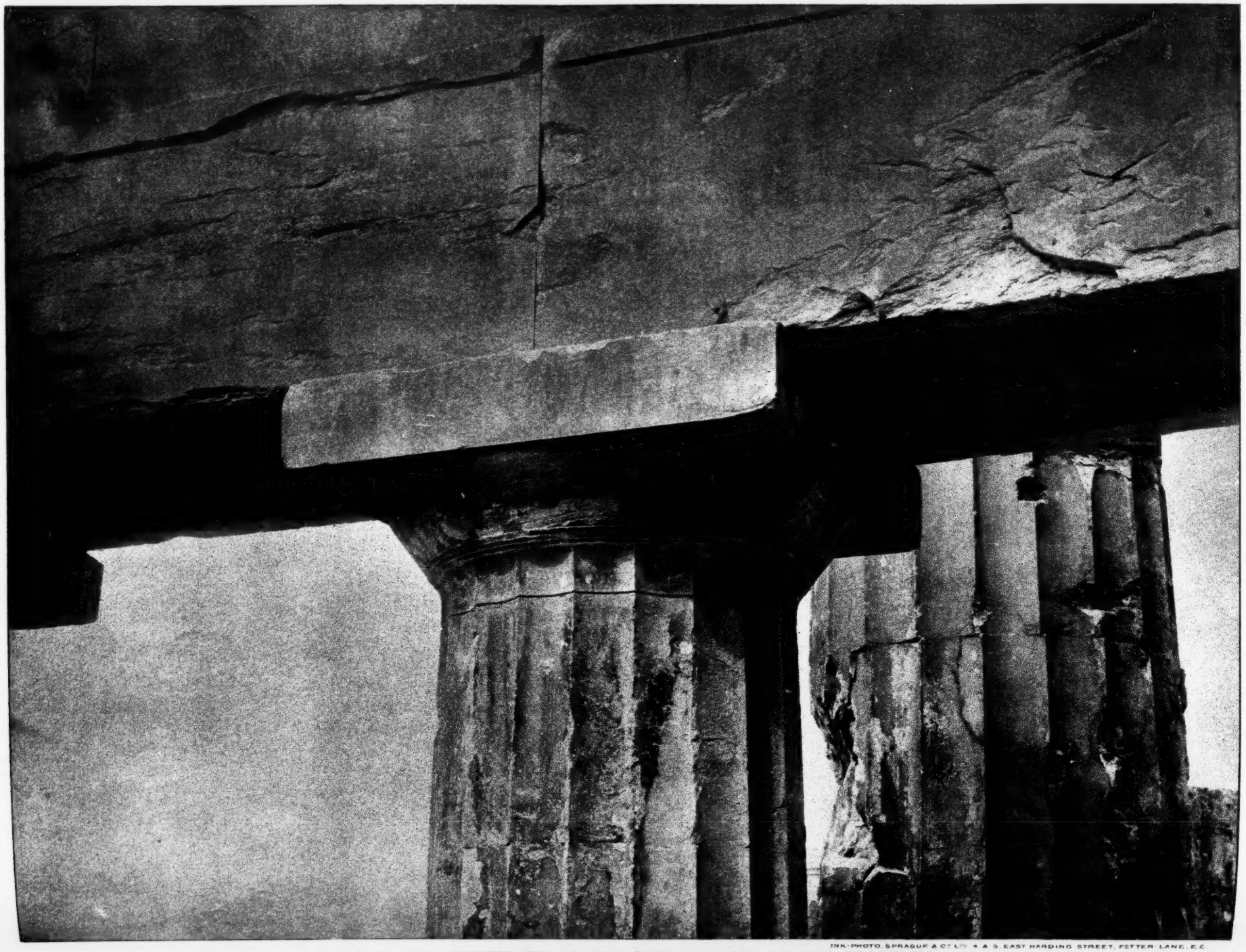

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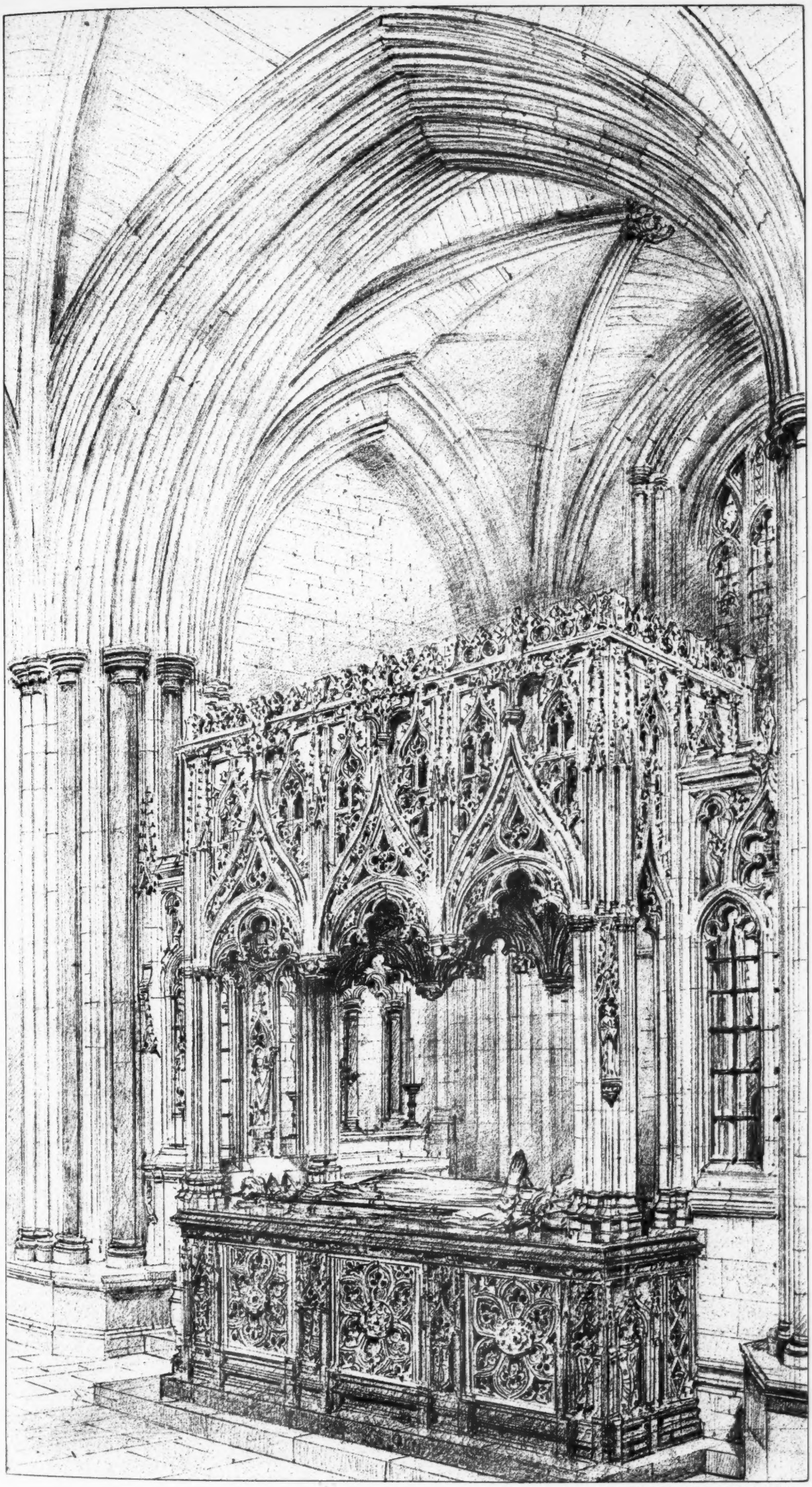

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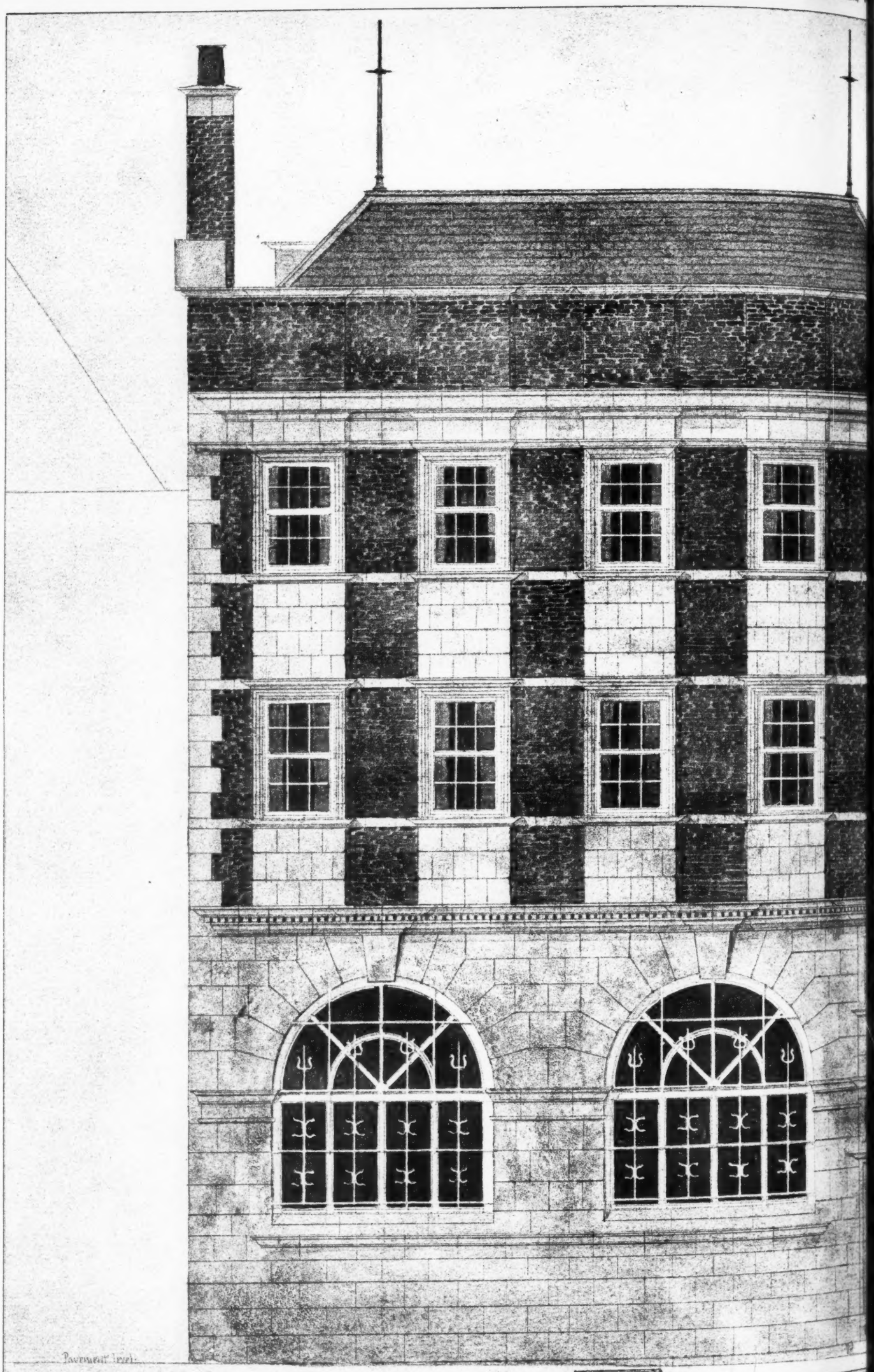

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¼ SCALE.

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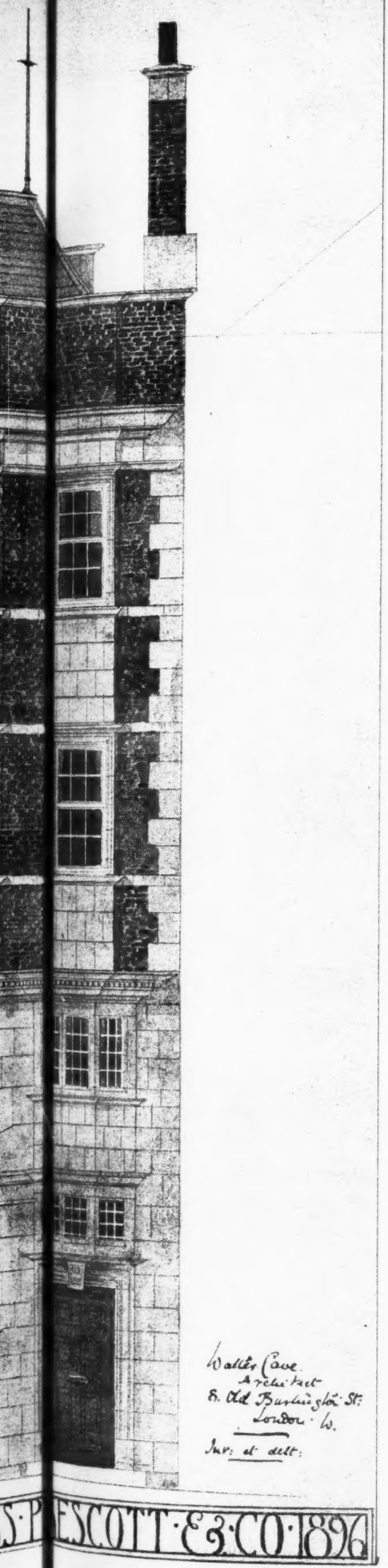
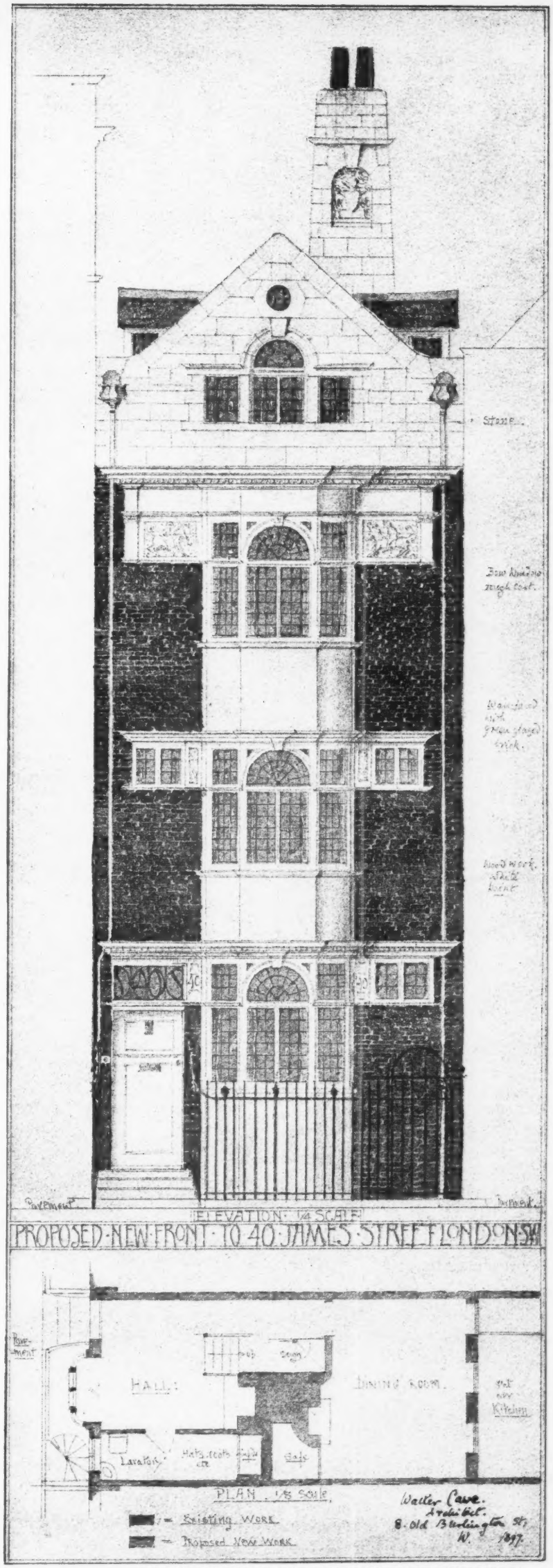


Walter Cave.
Architect
8. Old Burlington St:
London · W.

Inv: et delt:

S·PRESCOTT·&·CO·1896



INK-PHOTO SPRAGUE & C° LT° 4 & 5 EAST HARDING STREET FETTER LANE E.C.